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Determining Recoupable Funds Using the Military Construction, Army Mobilization Program (MOBPRO)

by
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During mobilization, resources may be diverted from lower priority construction projects to projects that directly support the mobilization. The use of the Corps-wide, automated Mobilization Program (MOBPRO) for the first time in Fiscal Year 1990 revealed the need for field guidance in estimating amounts of recoupable resources that might become available from early termination of construction projects. Such estimation is not always straightforward since a construction project's percent completion does not necessarily reflect the type or amount of resources recoupable at that point in time.

This study analyzed the process of construction project termination to find out whether more reliable guidance could be developed. Personnel from Corps of Engineers District and Area Offices were interviewed to determine the factors influencing construction project termination, and the construction contract clauses that significantly affect the amount of recoupable resources.

The study explored several concepts and developed a formula for estimating recoupable resources. It concluded that, while an expert system could be developed to assist in estimating recoupable resources, such a system would be costly to develop and would do little to speed the legal negotiating process that accompanies contract termination.

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FOREWORD

This work was conducted for the Directorate of Military Programs, Headquarters, U.S. Army Corps of Engineers (HQUSACE) under Military Interdepartmental Purchase Request (MIPR) No. E8791L188, dated April 1991, Work Unit QY1, "Formula and Manual for Recouping Money of Terminated Projects." HQUSACE technical monitor was Mr. John J. Sheehey, CEMP-P.

The research was performed by the Facility Systems Division (FF), of the Infrastructure Laboratory (IF), of the U.S. Army Construction Engineering Research Laboratories (USACERL). Part of the work was performed under contract by Mr. Patrick Tanner of Tanner and Associates, Champaign, IL. The project was conducted under the direction of Janet Spoonamore, Team Leader for the Military Programs Analysis Team. Mr. Alan Moore is Division Chief, CECER-FF, and Dr. Michael J. O'Connor is Laboratory Chief, CECER-IF. The USACERL technical editor was Mr. William J. Wolfe, Information Management Office.

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CONTENTS

	Page
SF 298	1
FOREWORD	2
LIST OF FIGURES AND TABLES	4
1 INTRODUCTION	5
Background	5
Objective	5
Approach	5
Scope	6
Mode of Technology Transfer	6
2 RESEARCH FOCUS	7
Overview	7
Contract Clauses	7
Data Collection	7
Data Analysis	8
3 RESULTS AND ANALYSIS	9
Description and Analysis of the Termination Process	9
Elements of the Process Requiring Estimation or Determination	15
Factors that Affect the Elements	17
Pool of Potentially Available Resources	18
Overall Estimation Procedure	19
Example of an Actual Construction Project Termination	20
More Comprehensive and Responsive Models	22
The "Rule of Thumb"	23
4 CONCLUSIONS AND RECOMMENDATIONS	31
Conclusions	31
Recommendations	31
REFERENCES	32
ABBREVIATIONS	33
APPENDIX A: Standard Fixed-Price Construction Contract Termination for Convenience Clauses	35
APPENDIX B: Termination for Convenience Settlement Form	39
APPENDIX C: Listing of Standard Fixed-Price Construction Contract Clauses	44
APPENDIX D: Standard Construction Contract Special Clauses	47
DISTRIBUTION	

FIGURES

Number		Page
1	Current MOBPRO Rule of Thumb	8
2	Chart for Estimating Government Liability	20
3	Contract Costs	26
4	Settlement Costs	26
5	Dollar Costs	27
6	Settlement Costs (\$)	28
7	Recoupable Funds (Likely)	28
8	Unconstrained Possibilities for $F-(F*Wp)-(C+v)$	29
9	$F-(F*Wp)-(C+v)$ Constrained	30

TABLES

1	Contractor's Initial Settlement Costs	22
2	Audit Review Results	23
3	Negotiated Settlement Costs	24
4	Recoupable Funds (Likely)	29

DETERMINING RECOUPABLE FUNDS USING THE MILITARY CONSTRUCTION, ARMY MOBILIZATION PROGRAM (MOBPRO)

1 INTRODUCTION

Background

Military Construction, Army (MCA) programming is a complex, dynamic process operating in an environment that involves many functional managers. At all levels of the MCA program management, from installations to the Army staff offices, officers must be able to articulate present and future MCA program needs, validate the programmed projects against some criteria, and communicate this information to the other offices/levels in a timely manner. The process is further complicated by the fact that funds for military construction (MILCON) projects are severely limited. Consequently, many valid projects get delayed from one program year to another, resulting in a backlog of MCA requirements. It can be difficult to decide how to best allocate limited MCA resources.

One program that helps managers through this decisionmaking process is the Corps-wide, automated, MCA Mobilization Program (MOBPRO). An important output of MOBPRO is the determination of the amount of MCA construction funds that can be recouped if a project is terminated early to free resources for mobilization needs. During mobilization, resources need to be diverted from lower priority construction projects to projects that directly support the mobilization effort. The use of MOBPRO for the first time in fiscal year 1990 (FY90) revealed the need for field guidance in the form of estimates or procedures to calculate the amount of recoupable resources for individual construction projects. When a construction project is terminated, its "percent completion to date" is not necessarily a reliable indicator of the type and quality of available resources, because the contractor may have legitimate claims related to materials in storage, on order, etc. Consequently, the final settlement cost to the Government after early termination can actually be more than the contracted cost of the completed project. Statistical information taken from the terminated contracts would yield a better estimate of the amount of recoupable funds. Furthermore, an expert system developed to operate on this basis could assist the action officers in making such decisions quickly under closely-timed mobilization scenarios.

Objective

The objective of this study was to develop concepts for calculating the amount of recoupable funds made available from early termination of MCA construction projects.

Approach

A literature search was performed to collect information on the types of contracts and contract clauses involved in early termination of MCA construction projects, and to gather historical information on actual projects that had been terminated early. A telephone survey was developed, and personnel at three Corps of Engineers District offices (Savannah, Mobile, and Baltimore), and at Headquarters, U.S. Army Corps of Engineers (HQUSACE) were interviewed by telephone. A field visit was made to the Baltimore District Office, where District and Area Office personnel were interviewed.

Scope

This research was limited to the study of recoupable funds to be gained from early termination of MCA construction projects, and was not meant to include other types of construction projects, such as Design Projects, or BASEOPS .K (maintenance) projects.

Mode of Technology Transfer

The concept developed in this study is intended for eventual incorporation, in the form of an "expert system" knowledge base, into the Military Construction, Army Mobilization Program (MOBPRO), which is maintained and distributed through the Office of Military Programs (CEMP-PA), HQUSACE.

2 RESEARCH FOCUS

Overview

This research took a two-pronged approach. One research focus was to investigate contract clauses and specifics. The other focus was to develop a standard formula to use as a "rule of thumb" for recouping resources.

Several questions on construction and construction contracts were pursued. Important considerations were: (1) the reasons for project termination, (2) the percent complete when terminated, (3) the settlement amounts, (4) the disposition of incomplete projects and, and (5) the alternatives considered. A look at construction practices considered: (1) stockpiling of material, (2) agreements between the prime contractor and subcontractors, (3) special-order equipment and, (4) equipment rental/purchases. An important factor is the unique way the Government does business. A review of the contract clauses helped to clarify standard termination wording, termination contingencies in specifications, and specific bidding requirements that might affect the costs when the contract was terminated.

Interviews with personnel at HQUSACE indicated that the Mobilization Program (MOBPRO) uses a rough "rule of thumb" to estimate recoupable funds from early project termination (Figure 1). Its premise, that the dollars remaining are inversely proportional to work completed to date, is not accurate and needs revision before the formula can be used for project planning.

Contract Clauses

This portion of the work was awarded to a contractor* whose responsibility was to collect data on: (1) terminated construction projects, (2) research construction practices used, and (3) research contract clauses as used by various districts and other area offices when contracting for work.

The contractor used the collected data to support (or reject) "rules of thumb" that Government decisionmakers use to either terminate a project early (to shift resources elsewhere), or to finish a project. Factors involve: stockpiling of material, subcontractor agreements, special order equipment, equipment rental/purchases, etc., and any other factors related or having impact should a contract be terminated. One special consideration is the amount of lead time a contractor commits to a project when awarded a contract, and how the Corps of Engineers may be able to use these already committed resources from one project to another.

Data Collection

Although the Government uses several types of contracts and contract clauses, the Corps of Engineers deals almost exclusively in fixed-price construction contracts. The set of contract clauses typically included in such construction contracts were investigated to determine those with the most significant impact on the amount of recoupable resources. Interviews with District Office Personnel contained the following topics for discussion: Pool of Available Resources, Elements of the Termination Process Requiring Estimation, and Factors Affecting the Elements.

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RECOUPABLE FUNDS

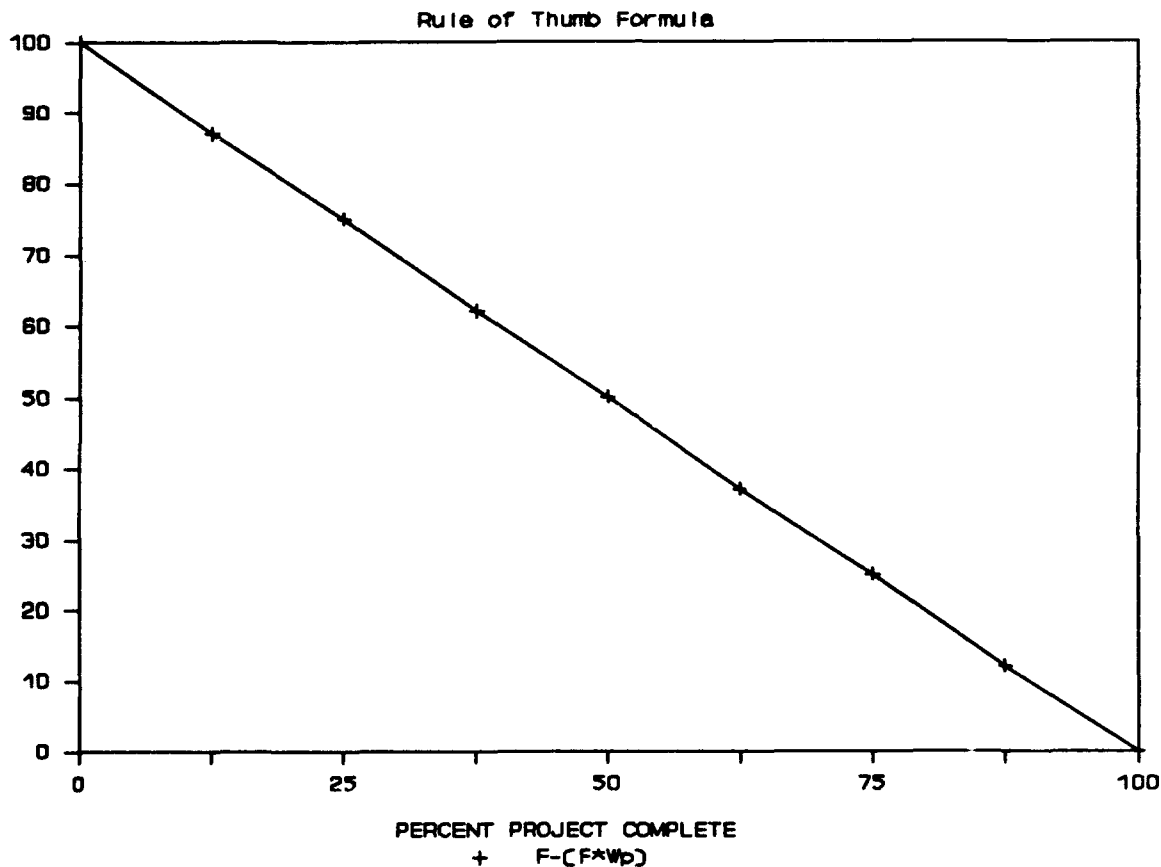


Figure 1. Current MOBPRO Rule of Thumb.

Since little actual construction contract termination data exists, project managers and contract personnel were presented with hypothetical termination scenarios, where the factors that are thought to affect termination the most, were presented for analysis and discussion. During the discussions, the reasons (heuristics) for the amount of effect were recorded. The results are presented in Chapter 3, "Results and Analysis" (p 9).

Data Analysis

To keep the broadest possible analytical perspective, the overall termination for convenience process was analyzed. This analysis addressed Government-Contractor contractual and cost liabilities and how these liabilities relate to construction contracts in particular. Interviews and field data identified the cost elements that need to be estimated within the context of a construction contract termination for convenience. Project managers and contract experts identified the factors associated with construction projects and their contracts that affect the cost elements. One actual construction project termination was reconstructed to analyze the termination process (p 20).

3 RESULTS AND ANALYSIS

Description and Analysis of the Termination Process

Much of the following paragraph was extracted from interviews with Corps of Engineers District and Area Office personnel, from the two Federal Acquisition Regulation (FAR) Clauses that address termination for convenience of the Government, and from summaries that describe the contractual perspective in a termination for convenience. While most of the available experience involves weapons systems and munitions contracts, which are normally part of a high-volume production process and which are usually of the cost-reimbursement type, there are elements in common with these terminations for convenience and the terminations that construction contract administrators would experience in a fixed-price environment. FARs suggest preferred methods for determining Government liability in convenience terminations, which involve interpreting fixed-price contracts as hybrid cost-reimbursement contracts. The FARs go even further limiting these liabilities, even though the Government's right to terminate a contract for its convenience is unique and is done unilaterally.*

The Government generally includes, as a standard clause in its contracts, a provision permitting it to terminate contracts for its convenience (Appendix A). Generally referred to as the Termination For Convenience clause, this clause enables the Government unilaterally to end a contract when it is in the Government's best interest to do so. Virtually any reason, including recovery of funds for use in mobilization, is valid cause for the Government's early termination of a contract, and only when a contractor can prove that the Government acted in bad faith or abused the process, can the validity of such a termination be questioned.

In return for the Government's unique termination right, the clause entitles the contractor to recover in a settlement: (1) costs incurred in connection with performance up to the time of termination; (2) profit on those costs; (3) the costs of settling and paying claims on subcontracts or orders affected by the termination; and (4) the expenses of closing out the contract, including those connected with the actual settlement.

The Contracting Officer takes the first step in the termination for convenience process by notifying the contractor, in writing, that the contract is being terminated. Upon receipt of a termination notice, the contractor must stop work on the contract, initiate all actions necessary to close out the contract, and submit a settlement proposal. The settlement proposal informs the Government of what the contractor expects to recover for the termination and forms the basis for the ultimate amount of the settlement. A settlement proposal must be submitted within 1 year of the effective date of termination. A contractor who fails to submit a proposal within the required year loses the right to appeal a final settlement determination made by the Government.

After a contractor submits a termination settlement proposal, the regulations suggest that the parties negotiate a settlement agreement. Fixed-price contracts (as are most Corps construction contracts) can be difficult to negotiate because such contracts do not require the keeping of detailed cost records (as do cost-reimbursement contracts). Such records are vitally important in determining the cost recovery for a convenience termination, and generally help negotiate a settlement. Since the contractor with a cost-reimbursement contract has the option to recover costs for up to 6 months after termination through the continued submission of cost-reimbursement vouchers, the settlement for such a contract may consist only of determining a fee adjustment.

*Rather than cite each section and page of the FAR, pertinent sections are summarized throughout the document.

The regulations give several agreement forms to show what the ultimate settlement should provide. The dollar amount of a contractor's claim in the settlement proposal is important, and these amounts are subject to an audit if they exceed certain dollar limitations. After submitting a proposal, but prior to final settlement, a contractor may receive partial payments of claimed costs when entitlement to those costs is clear. These payments may not exceed the total amount due to the contractor when all relevant credits and claims of the Government are recognized, and the payments also may not include any part of the contract fee. If partial payments exceed the amount found due the contractor upon final settlement, the Government is entitled to recover the excess costs paid, together with interest on this amount from the time of its payment until the costs are recovered. Partial settlements are discouraged, being permitted only when it will not prejudice either party in relation to a complete settlement.

Under regulations, there is a mandatory imposition of cost principles for pricing termination settlements, whether the terminated contract is of the fixed-price or cost-reimbursement type. This ordinarily presents no problem when the contract terminated for convenience is of the cost-reimbursement type, because the contractor will already have taken the cost principles into account throughout the life of the contract. However, termination of a fixed-price contract may disallow some costs that would have been recovered in absence of the termination, since the contractor with competitively awarded fixed-price contract may have included costs in the contract's fixed price that will not be allowed in an early-termination settlement.

On termination, fixed-price contracts are in effect converted to hybrid cost-reimbursement contracts. While cost principles clearly assume a role in determining which costs will be reimbursed, the exact nature of this role is unclear, and their application will not be the same as in the case of a cost-reimbursement contract. For example, in one case, a contractor involved in litigation had incurred substantial contract costs before its fixed-price contract was actually executed and had included these costs in its bid. He would have recovered them when the contract was completed, assuming satisfactory contract performance. Because of the imposition of cost principles for determining settlement cost allocability, the Armed Services Board of Contract Appeals held that these costs, in the form of precontract costs of inventory, were not reimbursable to the contractor. On appeal, however, the Courts held that cost principles alone are not the sole determining factor of allocability when a fixed-price contract is terminated. In such cases, the Government is required to consider the fairness of strictly applying cost principles. Since the Board had not considered the fairness of the result of its strict application of cost principles, the Courts turned the matter back to the Armed Services Board of Contract Appeals for further consideration.

As indicated above, settlements in terminations are based upon settlement proposals. These proposals detail all costs attributable to the terminated work, including the costs of the settlement process itself, and show the amount that the contractor expects to recover. Note that a contractor must include all settlements of subcontracts in a proposal, although such settlements are considered matters solely between the contractor and the subcontractor. However, the Government does have the right to settle subcontract claims when that is considered in its best interest.

Of the various formats for the settlement proposal, all provide identical treatment for fee and profit-or-loss adjustments, settlement expenses, and Government credits. The forms mainly differ in treating costs incurred before termination in terms of the accounting basis (discussed below) used for preparing the settlement proposal. An example settlement form is shown in Appendix B. No matter which basis is used in a form, it will be subject to that limitation on a contractor's general entitlement to recover costs incurred before termination, which exists when the contract contains a First Article Approval clause, placing certain cost risks upon a contractor until Government approval is received. Once Government approval is given (e.g., on inspection of the progress on a construction project and partial payment), these limitations disappear. But in the event of a termination prior to the approval, a

contractor's recovery will be limited to only those costs necessary to the first article effort. Thus, costs of contractor's advance purchases or beginning construction effort will not be recovered unless the necessity for costs incurred prior to first article approval is established. This is almost always the case in Corps of Engineers construction contracts, since the contractor usually begins mobilizing his required work force and ordering equipment and materials even before a Notice to Proceed is issued by the Government.

The preferred accounting basis for preparing a settlement proposal is the inventory basis, the preference arising from the fact that for this method the contractor must compute and set forth the costs that apply to the termination. If this method cannot be used, the second method authorized by the regulations is the total-cost basis. Use of any method other than these two requires the approval of the appropriate procurement official.

The inventory accounting basis tries to include all costs of termination in the costs of the termination inventory. This method requires separate itemization of categories of costs, some of which will involve the use of inventory schedules. For purposes of this method, costs are divided into those that reflect contract costs in the unit prices of the termination inventory, and those that do not.

Costs that reflect contract costs in the unit prices of the termination inventory will naturally vary with the precise nature of the terminated fixed-price contract. A discussion of the major cost elements follows.

Items that have not entered the construction process will be priced at their acquisition cost plus any applicable transportation or related charges for purposes of being included in a settlement proposal. Since no work has been performed on these items, they generally bear little labor and overhead charges. Common items that can be used in the contractor's other work without any loss of their useful value are not listed in the settlement proposal, although handling and related costs may be recovered as a settlement expense. Thus, the stockpiling of excess materials will not be an allowable settlement expense since the contractor must show title to the materials (a paid invoice) and identify the materials specifically with the construction project.

Excluded from the classification of common items are those items that are Government-furnished, or that are required to be delivered to the Government. Since these items are (or will be) the property of the Government, they comprise a part of the termination inventory being transferred to the Government upon settlement. When a contractor draws material from the inventory for the contract, and the items are not placed into the construction process, these items also are not listed in the settlement proposal because they are not considered to be necessarily assigned to the contract.

Another limitation on the recovery of raw material cost is that imposed by the concept of reasonableness. The materials may not have been purchased in an excessive amount, or such excess will be unallowable. Here again, this prevents a contractor from stockpiling materials. But allowances are made for such expected costs as those of spoilage, defective goods, and test samples. Recovery of these costs will be allowed to the extent they are not included in the cost of completed performance.

Once materials have entered the construction process, they accumulate costs of labor and overhead. For purposes of inclusion in a settlement proposal, these added costs are included in unit prices, to the extent the materials have received the costs. Thus materials will bear greater unit costs the farther they advance toward completion, up to a maximum limit of the unit price for finished goods contained in the contract.

The cost of articles that have completed a production process (such as pre-engineered building components), but have not been delivered, can be claimed in the settlement proposal at their contract unit price, but items accepted and paid for are not included in the proposal. If the Government does not require delivery of the items, the price should be reduced to reflect saved freight and handling charges, to the extent such costs were included originally in the unit price. Since some defective goods are normally expected in the course of contract performance, costs of a reasonable number of such items will be recoverable in a termination settlement.

Equipment items are treated in a manner similar to termination inventory. However, the way the items were reflected in the contract price will affect their treatment in the settlement proposal. If the cost of these items was included in the unit price of the contract products, separate recovery will not be permitted. On the other hand, if the items were priced separately in the contract, recovery will be permitted to the extent that such amounts have not been previously reimbursed.

Under the inventory method, contract costs should be included in unit prices as much as possible, such costs encompassing the acquisition cost to the contractor, labor input, and applicable overhead costs. When the contractor's records will not permit such treatment, or when inventory item prices will not permit the contractor to recover certain incurred costs, the costs may still be included in the settlement proposal prepared on the inventory accounting basis. Costs treated in this way often include initial or preparatory costs, continuing costs, and general and administrative expenses not recoverable as part of inventory items.

When initial or preparatory costs are claimed, problems of proof and estimation arise. Initial costs are incurred in the less-efficient beginning stage of construction, and are expected to be recovered in later stages. Generally, the unit prices established in fixed-price contracts will represent the average price anticipated over the total contract production effort. When a contract is terminated, the contractor is deprived of the most efficient performance time. Under such circumstances, the contractor must prove the extent of construction costs included in the cost of the terminated work. Otherwise, a smaller profit or a loss may be imposed. These costs are especially applicable to the Corps of Engineers' construction contracts as noted in the section under "Example of an Actual Construction Project Termination" (p 20). In one \$15M construction contract, a Notice to Proceed had not yet been issued, but the contractor had incurred and proved that he had incurred substantial preparatory costs. The Government and the Contractor settled for almost \$80,000.

Costs that continue after a termination are pertinent in a termination settlement only if they are unavoidable. These are costs caused by the termination, or costs that would otherwise have been incurred and recovered in contract performance, but that cannot be eliminated immediately upon termination. Although the costs of unabsorbed overhead normally are unallowable in a termination settlement, normal cost components of unabsorbed overhead may be recoverable if separately identified and proven to be continuing costs of the termination. Costs shown to have been incurred solely for work on the contract will be allowed, even though they appear in the form of depreciation, maintenance, or other expenses characteristic of overhead. To this end, the direct charging of costs normally treated as indirect, which is permitted in termination proposals, aids in contractor recovery.

Reimbursement of all costs attributable to the terminated portion of a contract also requires recovery of any general and administrative expenses not recovered as part of the termination inventory. Such costs are present when the administrative effort associated with the contract exceeds the actual costs of performance. This unusual situation may occur when the termination comes early in contract performance, or when continuing costs generate these expenses in significant amounts.

Under regulations, if a contractor's records do not permit submission of a settlement proposal on the basis of termination inventory, or if the use of that method would delay settlement, the Contracting Officer may permit the contractor to base a termination claim on total contract cost. This way, instead of including costs of performance in inventory unit prices, the cost categories of material, labor, and overhead are treated separately. No distinction is made between the types of materials in inventory, since each item bears only its acquisition cost, plus any relevant freight or handling charges.

An adjustment must be made for the fee when the terminated contract is of the cost-reimbursement type, and for profit or loss when the contract is of the fixed-price type. Such an adjustment will be necessary since the terminated contract will result in the performance of less work by the contractor than anticipated.

A contractor is entitled to recover the reasonable costs of contract close-out, i.e., settlement expenses. Since settlement costs are not considered part of the contract costs for which recovery is limited by contract price, inclusion of settlement costs might result in a total recovery larger than the contract price. Settlement expenses are basically those costs that would not have been incurred had the contract proceeded to completion. These costs are incurred by the contractor in fulfilling the duties imposed by the termination. Such duties include the following as set forth in regulations: stopping work; terminating affected subcontracts; advising the Contracting Officer of any special circumstances precluding work stoppage; performing any work not terminated; protecting and preserving property in which the Government has or may acquire an interest; advising the Contracting Officer of any legal proceedings arising from the terminated work; settling all terminated subcontracts; submitting a settlement proposal; and disposing of termination inventory. Predominant among the various settlement expenses that a construction contractor will typically incur because of a termination for convenience are those connected with the settlement proposal: protecting and disposing of inventory, and terminating and settling subcontracts.

Costs incurred in preparing, presenting, and supporting a contractor's settlement proposal for the Government and for subcontractors are generally allowable costs of settlement. Such costs may be incurred because of the employees' or independent professionals' services, and could include accounting, legal, and clerical work. These services may result in considerable contractor expense. If the work is performed by independent professionals, the cost is the fee paid. When the contractor's employees perform the activities, salaries or wages and identifiable indirect costs generated by the activities are considered. Since this effort is not part of the normal construction effort, the full application of overhead costs will not be allowed, but costs that can be associated directly with the settlement effort, such as travel costs, may be recovered. There are some exceptions to allowable expenses. For example, the cost of appealing a Contracting Officer's adverse decision will be an unallowable settlement expense because it does not relate to settlement negotiations. Similarly, costs of preparing and presenting a claim for anticipated profits will be disallowed because such a claim is seen as unreasonable.

The reasonable costs of protecting and disposing of unused material, equipment, and the uncompleted construction project also are considered allowable costs of settlement. Such costs may include an allocation of overhead costs to the extent they can be shown to be attributable to closeout activities. Typical costs of closeout include expenses for storage, transportation, handling, protection, and selling, including the salaries or wages of the personnel performing and supervising such tasks. The nature of these costs will depend largely on the instructions for inventory disposal provided by the Contracting Officer. An example of a contractor's recovery of such costs involved a situation in which the contractor, after the contract was terminated, stored the termination inventory pending ultimate disposal only to have it destroyed by fire before disposal could take place. Since the risk of loss under the contract had been placed on the contractor, the Government was credited for the costs of the destroyed items, but the contractor's storage costs up to the time of the fire were allowed.

When a contract is terminated, it is the contractor's duty to terminate and settle all affected subcontracts. Settlement of subcontracts generally follows the same rules that apply to prime contract settlement. Note, however, that as a general rule subcontractors possess no rights against the Government; the rights of subcontractors are controlled solely by the terms of the subcontract. Government recognition of subcontract settlement costs is determined by the rules for cost allocability under the prime contract. For this reason, contractors are advised to include termination clauses in their subcontracts similar to those employed in prime contracts; otherwise, a contractor may be liable to a subcontractor for more costs than the Government will reimburse.

After a contractor has reached a tentative settlement with a subcontractor, the settlement is subject to approval by the Contracting Officer. When small claims are involved, the Contracting Officer may allow the contractor to settle minor subcontractor claims without approval. When a contractor submits tentative settlements to a Contracting Officer, the contractor must certify that: (1) all subcontractor claims have been examined; (2) all such claims are associated with the terminated portion of the prime contract; and (3) the total settlement is fair and reasonable, was negotiated in good faith, and is not more favorable to the subcontractor than if the Government were not involved. In addition to being subject to Contracting Officer approval, large tentative subcontract settlements (in excess of \$25,000), are subject to audit by the Government. The Government also retains the right to involve itself in subcontractor settlement efforts when it is considered in its best interest to do so.

After an amount for a termination settlement has been determined in terms of costs, adjustments for the fee or for profit and loss, and settlement expenses, this amount must be reduced by any credits due to the Government. Credits generally arise from the disposal of inventory, prior contract payments, and Government claims against the contractor. Credits arising from inventory disposal and prior contract payments are discussed below.

In a normal Government contract, the Government receives the supplies ordered under the contract, and any special equipment specifically required. When a contract is terminated, these same items are acquired to the extent of their completion before termination. In the event of a termination, the Government may not wish to retain the contract residue, and in that case, the Government is entitled to receive a credit for those items against its obligation to the contractor.

The regulations provide rules for the disposition of termination inventory, establishing the following possibilities for disposing of contract items: delivery to the Government to satisfy known Government needs; purchase or retention by the contractor or subcontractor at cost; return to suppliers; screening for Government retention to satisfy various agency needs; donation; sale (including the purchase or retention by the contractor or subcontractor at less than cost); and abandonment or destruction. Regardless of the method selected for inventory disposal, the contractor will receive the reasonable costs of disposal as a settlement expense.

When the Government retains the item, no credit is given to the Government. The items will thus be included in the contractor's settlement proposal and transferred or disposed of on the Government's behalf. When the item is retained by a contractor or subcontractor at cost, or returned to the vendor, the item is excluded from the contractor's settlement claim since it is not being transferred to the Government. Returning items to the vendor is a less-favored approach than retention at cost, since the vendor's normal stocking charge, up to the limit imposed by the regulations (15 to 25 percent) will be an additional settlement expense to be reimbursed by the Government.

In arriving at the total amount due to a contractor in a termination settlement, all previous contract payments must be deducted from the total amount due. These include any advance payments, progress payments, or partial payments made for contract performance. If total payments made exceed the

amount due to the contractor, the Government is entitled to recover the excess, plus interest on that amount from the date of payment to the date of recovery.

A termination for convenience need not terminate all work under a contract. The Government may, under the Termination for Convenience clause, terminate only part of the work. When a contract termination affects only a portion of contract performance, the contractor must continue with the remaining portion of the contract, while settling the costs of the terminated work. Settlement of the terminated work generally follows the rules applicable for complete termination. In addition, the contractor will be entitled to receive an equitable adjustment on the continuing work of fixed-price contracts if the termination has caused costs for such work to increase.

A partial convenience termination is an appropriate consideration, since a large construction contract may be composed of several phases, such as the main structure, satellite structures, roads, landscaping, etc. It may be desirable in some sense (efficiency, for example) to complete construction of the main structure and some of the roads so that beneficial occupancy can be provided, but to terminate the satellite structures and landscaping.

In the contractor's settlement proposal for the terminated work, costs attributable to the continuing work must naturally be excluded. If settlement is made using the inventory basis, there is no change in the procedures used, but when the total cost method is used for settlement, the contractor's proposal is not submitted until after the remaining performance has been completed. On cost-reimbursement contracts, the settlement proposal must still be submitted within 1 year of the termination, but the settlement will consist only of a fee adjustment. All costs must be recovered through continued submission of cost vouchers.

The equitable adjustment granted on the continuing work for fixed-price contracts is basically a repricing of the remaining contract effort to recognize its reduced scope. A reduction in scope often will cause prices to rise due to such factors as the loss of volume purchase discounts, a loss of the learning curve benefits to be recouped on later construction, and an increase in overhead resulting from the same amount of fixed costs being allocated over a smaller base. The Government, recognizing these effects, permits an adjustment in the price of the remaining work, provided the claim is filed within 90 days of the partial termination and does not include any costs of the terminated work.

Elements of the Process Requiring Estimation or Determination

Official cost records and construction status (percent complete) usually lag a month or so behind the actual contractor earnings and true construction-percent complete. With regard to contractor earnings, a fixed-price construction contract provides less detailed information than a cost-reimbursement contract. Since the Corps of Engineers deals almost exclusively in fixed-price contracts, there could be a significant disparity between (1) the percent complete as reported in COEMIS (Corps of Engineers Management Information System), which is the "official" cost information system of the Corps of Engineers, or (2) the percent complete as reported in AMPRS (Automated Management and Progress Reporting System), which is the Corps of Engineers' "official" construction management system, and true contractor earnings or true construction percent complete.

Determining the Actual Sunk Costs for the Project includes estimating actual labor usage, and materials and equipment that have become part of the construction project since the period covered by the most recent pay estimate submitted by the contractor.

Many contract clauses deal with subcontractors. For example, clause Number 11 52.209-0006, "Protecting the Government's Interest When Subcontracting with Contractor Debarred, Suspended, or Proposed for Debarment" (May 1989) places a \$25,000 cap on the size of a subcontract with a contractor that has been debarred, suspended, or proposed for debarment, unless there is some compelling reason for entering into an agreement with such a subcontractor. If there is a reason, the Contracting Officer must approve the agreement in advance. Other contract clauses that would affect the amount of recoupable dollars are:

1. Number 17. 52.214-0028, "Subcontractor Cost or Pricing Data—Modifications—Sealed Bidding" requires a contractor to follow procedures similar to those followed by the Government during the contract award process for subcontracts (including modifications) in excess of \$100,000. The contractor is required to submit cost or pricing data to the Government for each subcontractor, unless the subcontract amount is based on adequate price competition based on established catalog or market prices of commercial items sold in substantial quantities to the general public or set by law or regulation.

2. Number 21. 52.219-0016, "Liquidated Damages—Small Business Subcontracting Plan."

3. Number 24. 52.220-0004, "Labor Surplus Area Subcontracting Program."

4. Number 33. 52.2220011, "Subcontracts (Labor Standards)" requires contractors to insert labor standards (Davis-Bacon Act-related contract clauses) into subcontracts.

5. Number 78. 52.244-0001, "Subcontracts (Fixed-Price Contracts)" applies to subcontracts resulting from unpriced modifications to firm-fixed-price contracts.

and similarly:

6. Number 84. 52.249-0001, "Termination for Convenience of the Government" (Fixed-Price) (Short Form), and

7. Number 85. 52.249-0001, "Termination for Convenience of the Government" (Fixed-Price).

The Government often recommends that contractors place (6) and (7) in every subcontract for the contractor's own protection.

There are more contract clauses that affect the amount of recoupable resources other than the ones listed above. However, with the exception of (6) and (7), the ones listed above and other contract clauses could be used against the contractor in the legal maneuvers of the settlement process. For example, if a contractor did not ensure that his subcontractors complied with the Davis-Bacon Act regarding his employees, the Government could use that as a legal tool to recover more money. But the focus of this study is not primarily legal, but is, rather, an engineering and estimation focus. Thus, in the context of this effort, Terminating Affected Subcontracts involves determining Government liability with regard to actual labor usage and materials and equipment that have (1) become part of the construction project, (2) been purchased but not used, and (3) been ordered from suppliers.

In a convenience termination, the contractor will incur certain costs for "demobilizing" his work force and subcontractors. The Government is usually required to pay the contractor for activities such as making the construction site safe and secure. This may include disposing of the inventory of supplies, materials, and equipment. For construction contracts, this refers to materials and equipment that the Government has either paid for and have become part of the constructed facility; or that is on order from the contractor's suppliers.

The expenses incurred by the contractor in preparing and submitting a Settlement Proposal can be large and can include required in-house personnel salaries and overhead or professional fees for lawyers and accountants.

Factors that Affect the Elements

Many factors involved in a construction project affect the amount of recoupable resources. The factors thought to affect the amount the most are given in this section. One such factor is the Notice to Proceed.

Immediately after contract award, the contractor usually is involved in mobilizing his work force and subcontractors. Thus, even though construction has not yet begun, the contractor has incurred expenses. It is important to note here that in the construction contract administration process, the Government requires the contractor to be prepared to do the work on schedule. This involves many actions such as developing shop drawings and initiating activities with subcontractors, bonding agents, banks, and suppliers.

The type of contract—Fixed-Price or Cost-Reimbursement—affects mainly the element of Actual Sunk Cost since the real status of the contractor is better estimated with the detailed reporting requirements of a cost-reimbursement contract than it is with a fixed-price contract. This is especially important in the case for subcontractors and suppliers and their required reporting visibility in a cost-reimbursement contract.

Another factor is the type of project. An earthwork project, which is mostly labor and involves no special equipment or materials, would allow a larger percentage recovery than, say, a hospital or a storage facility. The types of projects (taken from the 3-digit Facility Class and Construction Category Codes) are as follows:¹

- Operational and Training Facilities
- Maintenance and Production Facilities
- Research, Development, Test and Evaluation Facilities
- Supply Facilities
- Hospital and Medical Facilities
- Administrative Facilities
- Housing and Community Facilities
- Utilities and Ground Improvements
- Real Estate.

Several additional classifications may fall into more than one category and may be considered as sub-factors or characteristics of the project that have an impact on recoupable resources.

These classifications include: (1) the degree of vertical versus horizontal work involved; (2) the method of construction; (3) the type of structure; (4) the complexity of the project; and (5) the use of special equipment items. Generally speaking, horizontal work is more labor-intensive than vertical work, requiring (proportionately) smaller amounts of materials and equipment. The method of construction refers to whether a project is mostly site-built or mostly pre-engineered. If the project is constructed

¹ Army Regulation (AR) 415-28, *Department of the Army Facility Classes and Construction Categories* (Department of the Army [DA], 1 November 1981).

mostly with pre-engineered building components such as pre-cast beams or fabricated steel components, then the amount of labor required on-site can be reduced to as little as 15 percent: in general, the less on-site labor involved, the lower the amount of recoupable resources. There are differences in the amount of labor involved in a project depending upon the mix of materials such as reinforced concrete, structural steel, masonry, or wood. Projects requiring the use of highly reinforced concrete shielding are, generally speaking, more complex to build, possibly involving the use of special equipment during construction. The complexity of the project might be reflected in its cost per square foot. Special or unique, expensive equipment items and control systems generally reduce the amount of recoupable resources as the construction progresses toward completion. Examples of these items include Intrusion Detection Systems, Phone Systems, Medical Gas Systems, Energy Monitoring and Control Systems, and Wind Tunnels.

Contract categories dealing with Contract Clauses, Special Provisions, and Required Submittals are factors that refer to those contract clauses that pertain to the execution of the construction project, such as whether or not there are Government-furnished materials or equipment, stored materials (on-site or off-site), or contractor agreements with subcontractors regarding ordering required materials. Also, the project manager may keep a submittal register that provides (by way of a bid item or special provision) an update on when the contractor may conduct activities such as ordering supplies or obtaining technical information.

The scope of the project refers to the dollar amount of the project and could affect all of the cost elements requiring estimation. Costly projects, generally, may take longer to construct than less costly projects. "Claims, Disputes, and Modifications" is the factor that refers to pending changes in the "Scope of the Project." The "Contractor Earnings to Date" refers to the contractor earnings as reported by the most recent update of the construction management system (usually AMPRS).

Another factor refers to the length of (or schedule in calendar days for) the construction project. The contractor is more likely to order supplies sooner (for which the Government is liable) in shorter duration projects.

Whether the contractor is on or behind schedule may determine whether the contractor owes the Government liquidated damages. There is usually a liquidated damages clause or provision in the contract that allows the Government to credit the cost of liquidated damages. This clause can refer to the final delivery of the facility or to intermediate deliveries, and may result in a Government Credit (addressed below).

It is sometimes necessary to consider the size of the contractor or the general contracting organization. Generally speaking, a large, nationwide general contractor (with a team of attorneys) will recover more than a small, local general contractor.

Finally, the type of procurement must be considered. This factor refers to whether the project is a single or multiple procurement action. If it is a multiple procurement action, then a Partial Termination for Convenience may be a more appropriate course of action than a Complete Termination.

Pool of Potentially Available Resources

There is a pool of potentially available resources from which the costs of a settlement would be taken. This pool helps to determine an upper limit on the amount (or percentage) of dollars that are recoupable upon construction contract termination. These include: the "Current Working Estimate"

(CWE); open change orders; unused Supervisory and Administrative (S&A) costs; remaining Government-Furnished products; remaining contingency; Government credits; and other sources.

The CWE is the amount of obligated dollars that have not yet been expended (because of contractor invoices) by the Government. Open change orders is the amount of money represented by funds that are committed to the project for possible modifications, but not yet obligated. The unused S&A costs are the unused S&A dollars for the project. Care must be taken in determining the unused S&A. While the expended S&A amount is roughly equal to 6 percent of what has been paid to the contractor, there may be various percentages of the total S&A kept or redistributed at different Corps of Engineers management levels, i.e., at the OCE, Division, District, or Area Offices. The amount of remaining Government-Furnished products can be estimated from AMPRS data and represents the estimated or actual cost of U.S. Government-furnished supplies, material, equipment, and services (to the contractor). It should be noted that in some cases, e.g., Family Housing projects, the end-user of the facility (not the Corps of Engineers or the contractor) provides a portion of the resources for the project.

The remaining contingency is the value of the contingency reserve funds for the project. As a data element in AMPRS, it is equal to zero prior to contract award, and remains constant after contract award. There may be an amount due the Government (from the contractor) resulting from such actions as restocking of unused materials and equipment if the cost of restocking these items is less than 25 percent of their value. In addition, the retainer withheld until contract completion may be kept by the Government in the case of a dispute which results in liquidated damages assessed against the contractor. There may be a (positive) difference between the above-listed amounts that are potentially available and the Program Amount for the project (the portion that has been authorized and appropriated).

Overall Estimation Procedure

Estimating the amount of recoupable resources is a fairly complex, multistep procedure. Given the lack of information from actual project terminations, the model that could be developed would be more deterministic than stochastic. It is not entirely deterministic in that the functions (equations) that would be used in the estimation procedure are, in part, based upon the analysis of schedules for historical construction projects. Two ways to go about the estimation procedure would be:

1. Develop (or adapt) a series of charts for many combinations of the above-listed factors that affect the amount of recoupable resources. For a given set of factors, the charts would show a relation between the progress of the construction project and supplier schedules, materials ordered, materials stored (either off-site or on-site), materials used, equipment ordered, equipment used, labor usage, and S&A expenses. Upon contract termination, selection of the appropriate chart would be done by experts through the heuristics of the situation by identifying the appropriate factors that affect the amount and type of recoupable resources. Then, having determined the estimated Government liability to the contractor (and his sub-contractors and suppliers), subtract this liability from the Pool of Potentially Available Resources to determine the amount of recoupable resources. The development of a great many charts would be necessary to cover all situations; for example, if there were 10 factors at three levels each, then $3^{10} = 59049$ required charts. These charts would be developed through analysis of AMPRS data and an extensive number of interviews with project managers and construction contract administrators. But any change or update in the heuristics involved would require revising a significant number of these charts. Figure 2 shows an example of such a chart.

2. Develop a chart-generating mechanism with expert knowledge built in, that would prompt a user for the presence (and levels of their presence) or absence of the factors that affect the amount of recoupable resources, as well as information about the pool of potentially available resources. This

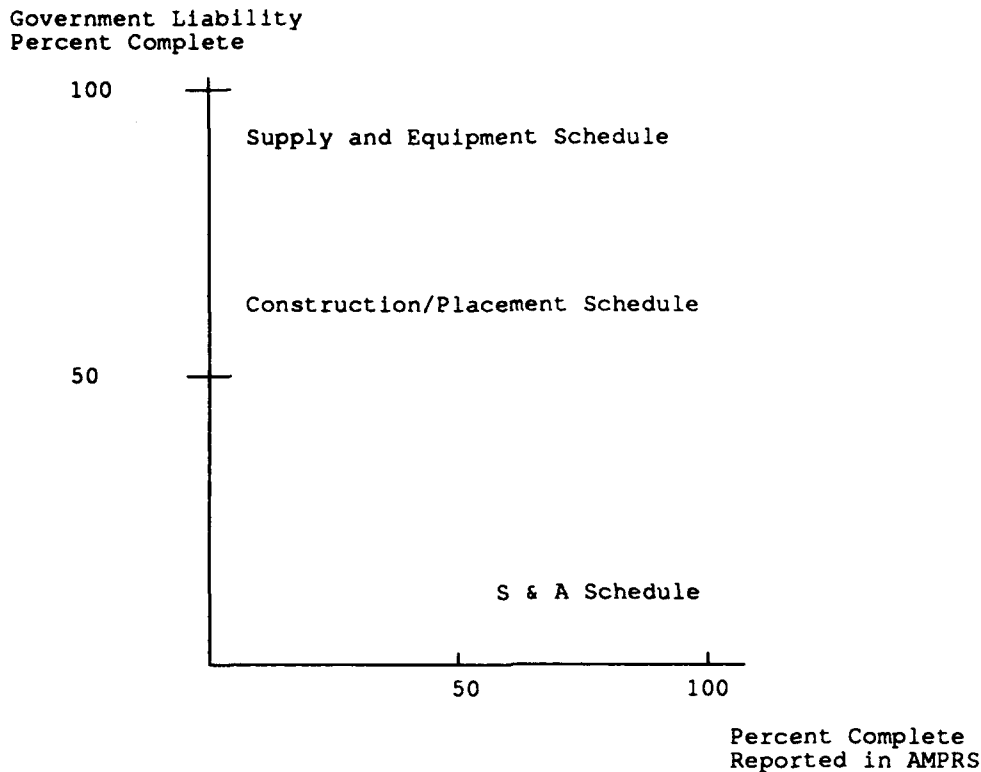


Figure 2. Chart for Estimating Government Liability.

mechanism could then relate the various factors involved by using rules of inference and a knowledge base to determine resource estimates of Actual Sunk Costs for the Project, Terminating Affected Subcontracts, Protecting and Preserving the Uncompleted Construction Project as Directed by the Government, Disposing of the Inventory of Supplies, Materials, and Equipment, and Submitting a Settlement Proposal. Results about the amount and type of recoupable resources could be displayed graphically or in tables, along with the reasoning behind the calculations. In addition (based upon values in the knowledge base), confidence statements could be generated that would estimate the likelihood of recovering various ranges of dollar amounts. Here again, the rules of inference involved and the knowledge base would be developed through extensive interviews with expert project managers and construction contract administrators.

Example of an Actual Construction Project Termination

The following example of an actual construction contract termination provides little guidance on how to proceed in the *general case* of estimating the amount of recoupable resources. Rather, it serves as a verification that the Government is still liable for contractor costs *before* a Notice to Proceed with construction has been issued by the Contracting Officer.

Background

This lump-sum, fixed-price contract for the construction of a helicopter stagefield at Fort Rucker, AL was awarded for a price of \$14,072,700. It was terminated completely (as opposed to a Partial Termination for Convenience) by authority of FAR 52.249-2, "Termination for Convenience of the Government" (Appendix A). The reasons for termination are relevant only in that they were not

challenged by the Contractor as being arbitrary or in bad faith. Several additional pertinent facts in this termination were: a Notice to Proceed had not been issued; the Contractor had not mobilized at the work site; no subcontractors were involved in the settlement; and no partial payments had been made.

Settlement Process

Since this fixed-price contract was converted to a hybrid cost-reimbursement contract upon termination, the costs in the Contractor's settlement proposal were structured by their elements of expense and burdened by appropriate overhead and profit rates. An additional cost element was added to cover the costs of the settlement.

Initial Settlement Costs

Table 1 shows the Contractor's initial settlement costs.

Initial Audit

The Defense Contract Audit Agency did an initial audit. Table 2 shows the results of the audit review and indicates the parts of the Contractor's proposed settlement costs that were questioned.

Construction Contract Administrator Analysis

The Construction Contract Administrator, who acted as the negotiator in the settlement, examined the Contractor's settlement proposal. While most of the Contractor's cost elements were questioned, the three largest elements were for Equipment, Overhead, and Direct Labor costs.

Equipment. The Contractor claimed to have selected a fleet of equipment and kept it in a standby state, dedicated to the contract. However, the Contractor could not adequately demonstrate possession of the equipment, or that the work force or equipment had been mobilized to the job site. Had this (mobilization) been done, the settlement amount might have been closer to the Contractor's original claimed costs.

Overhead. The overhead costs that the Contractor claimed were based mostly on a percentage of the equipment cost claim. Most of the overhead claim was disallowed.

Direct Labor. The final negotiated amount for direct labor was based on (and documented for) costs incurred for the project manager and field superintendents and for the labor involved in bid and preparation costs and some visits to the job site.

Final Settlement

Table 3 shows the final, negotiated settlement costs. The negotiations were described as difficult, due to the unique nature of a termination for convenience.

Contractor Costs. The Contractor's settlement proposal was based mostly on two major cost items: Equipment and G&A Expenses. The other claimed costs were minor. The Contractor's claimed costs for equipment were not supported with acceptable accounting data, so the negotiator had to rely on the auditor's recommendations. In one of the Contractor's revised settlement proposals, G&A expenses were derived using a formula that was not accepted or supported by the supplemental audit.

Table 1

Contractor's Initial Settlement Costs

Proposal Elements	Contractor's Settlement Proposal (\$)
Direct labor	62,377
Equipment	496,032
Other costs (\$):	
travel	14,150
misc.	2,760
overhead	<u>295,500</u>
Total	312,410
G&A expense*	29,071
Subtotal	899,890
Profit	89,989
Settlement expense	<u>6,096</u>
Net proposed settlement	995,975

*G&A = General and Administrative

Profit. No anticipated profit was included in the settlement. The settlement allowed a profit of 10 percent of direct incurred costs, excluding settlement expenses.

Settlement. Since the Total Contract Price was \$14,072,700, the amount recovered after contract termination was \$13,992,829.

More Comprehensive and Responsive Models

Projecting only the amount of recoupable resources from ongoing construction projects offers narrow support for the more general process, i.e., the mobilization effort. Under a general mobilization, the Corps of Engineers is responsible to the Army for more than a mere reporting and recovering of dollars, materials, and equipment from lower priority construction projects. The Corps of Engineers could support a mobilization effort by creating a stationing plan, determining locations and types of required facilities, and estimating the amount and type of required resources to deliver those facilities. From this critical information, the Corps could better balance its estimated capabilities against requirements, and determine its deficit (or surplus). Determining the amount and type of recoupable resources is the focus, but not the whole effort.

For example, if additional barracks space were required, there may be "temporary" World War II facilities either being demolished or scheduled for demolition that may satisfy part of the new housing requirement. Also, if the Corps were building a facility to support the mobilization effort, then that project would not be a candidate for termination. Thus, after specific stationing locations are known, an important step in the process is to determine those construction projects that are *candidates* for termination.

Table 2**Audit Review Results**

Proposal Elements		Costs Questioned (\$)
Direct labor		56,664
Equipment		496,032
Other costs (\$)		
travel	8,519	
misc.	1,757	
overhead	<u>295,500</u>	
Total	305,776	305,776
G&A expense		28,453
Subtotal		886,925
Profit		88,933
Settlement expense		<u>1,108</u>
Net proposed settlement		976,966

Under mobilization, the Corps of Engineers may want to divert contractor resources on current, lower-priority design projects to higher priority projects. Thus, the current contractor's labor force could be considered as a resource available to the Government, although sole-source contract authority may need to be issued. If, for example, the Mobile District Office had several Architect/Engineer (A/E) firms under indefinite delivery order design contracts, their labor could (possibly) be considered as a resource. Even though design projects may not be considered in a mobilization effort, design resources are still a valid concern, since standard mobilization drawings must still be site adapted.

Many Army installation DEHs have an Installation Support Book, which lists area contractor capabilities. This resource can help the Corps maintain estimates on location-specific resource capabilities to better estimate its overall capability to support the mobilization effort.

Finally, when the Corps has identified candidate construction projects for termination, and has estimated resource amounts, those projects should be prioritized for termination, either by order of the amount of recoupable resources, or by some (in)efficiency rating system such as the ratio of "Total Cost to Complete the Project Later" to "Original Cost to Complete."

The "Rule of Thumb"

The clauses discussed so far affect the Government's ability to recoup resources (dollars and other items such as material, equipment, etc.). This information leads to another issue: the validity of the current MOBPRO "Rule of Thumb" formula (Figure 1) and development of a more accurate formula. The discussions on contract clauses show that a "generic" formula would have to account for many circumstances. Devising a single algorithm to do this complex task may not be feasible.

Table 3

Negotiated Settlement Costs

Proposal Elements	Final Settlement (\$)
Direct labor	56,664
Equipment	496,032
Other costs (\$):	
travel	
misc.	
overhead	6,634
G&A expense	<u>3,242</u>
Subtotal	68,075
Profit	6,808
Settlement expense	<u>4,989</u>
Net settlement	79,871
Prior payments	None

Construction contracts have complex requirements and costs associated with those requirements. Costs can be simplified to some extent by categorizing costs and other expenses into five general groups: labor, Supervisory and Administrative (S&A), overhead, material, and profit. This is done for illustrative purposes only. Additionally, the percent of the total dollars for each category can vary significantly from one contract to another, and from bidder to bidder, based on the risks, technical difficulty, conditions (site, other), and so forth.

The government has already tried to devise formulas to determine and measure contractor recovery when there has been a delay or termination. Using such formulas can become quite cumbersome. For example, assessing the costs of unabsorbed overhead uses the "Eichleay formula,"² which is usually expressed in several parts:

For contract billings:

$$\left\{ \frac{\text{Total Billings for an}}{\text{Actual Contract Period}} \right\} \times \left\{ \frac{\text{Total Overhead Incurred}}{\text{During the Contract}} \right\} = \left\{ \frac{\text{Overhead Allocatable to}}{\text{Contract per Day}} \right\}$$

For Allocable Overhead:

$$\left\{ \frac{\text{Actual Days of}}{\text{Contract Performance}} \right\} = \left\{ \frac{\text{Overhead Allocatable to}}{\text{Contract per Day}} \right\}$$

² *Federal Procurement Law*, Volume II, p 1409.

and

$$\left\{ \begin{array}{c} \text{Daily} \\ \text{Overhead} \end{array} \right\} \times \left\{ \begin{array}{c} \text{Number of Days} \\ \text{of Delay} \end{array} \right\} - \left\{ \begin{array}{c} \text{Unabsorbed} \\ \text{Overhead} \end{array} \right\}$$

Other formulas used in determining unabsorbed overhead are the Carteret formula (adopted from the Carteret Work Uniforms case, 1954) and the Allegheny formula (Allegheny Sportswear Co., 1958), which are equally complex.

The approach taken in this study was to simplify the process by working with one rather than several separate equations. Such an approach may oversimplify the many variables involved in terminated or delayed contracts. This analysis uses the five general categories stated above. For illustrative purposes, an arbitrary percentage was assigned to each category (Figure 3). Because there is such a disparity from contract to contract, and the circumstances involved for any pricing or negotiation of final costs, the arbitrary assignment of percentages will serve for this analysis. (As there is no standard "formula," there is no right or wrong approximation.) In the graphs, and from here on out, S&A costs will be considered the same as G&A costs; the term "G&A" will be used exclusively. (This captures more of the terms under one general category than the standard S&A.) The total represents 100 percent of the total costs.

Figure 4 shows an arbitrary settlement cost. In addition to the five initial "cost" categories, there are two additional cost items: claims and expenses. (These general categories would be further broken down in analyses of actual projects). For this study, an arbitrary percentage was given to each category.

In the following example, the arbitrary assignments given in Figures 3 and 4 will be used as a reference point for all other calculations. In Figure 5, a dollar value was assigned to the percentages in previous graphs. A project of \$500,000 is assumed, so if the project goes to completion as scheduled, the Government will have invested the full \$500,000 for its product.

Figure 6 shows the settlement costs, by category, for this sample contract, assuming the information from Figure 4, and a negotiated settlement to cancel the project as soon as it is awarded, of 10 percent of the total contract. This amount is plausible for a settlement right after award because in practice, the contractor will incur expenses in mobilizing his workforce, negotiating agreements, and ordering supplies before the notice to proceed is given. This is common practice because the Government expects immediate results and the contractor is normally willing to oblige. Competition in the construction industry is such that a contractor must be ready to work and to be responsive to the demands of the contract to compete with other contractors bidding on the same work. Contractors include this "risk" in their profit margin.

Figures 3 to 6 give the background to show at least three points on a line graph for two equations that show the relationship between the percentage complete and recoupable funds. (Figure 7) These equations are MCBPRO's current "rule of thumb" equation, and a "modified rule" equation that is more likely (though still not representative in broad terms for contract settlement) to reflect that relationship. The points on a graph are: \$500,000 (\$500K) at zero percent complete; \$0 at 100 percent complete, and \$450K at zero percent complete. The vertical axis represents the total dollars to be "recouped" should a project be canceled at any point in the progress of the project. The horizontal axis represents the percentage of completion.

CONTRACT COSTS

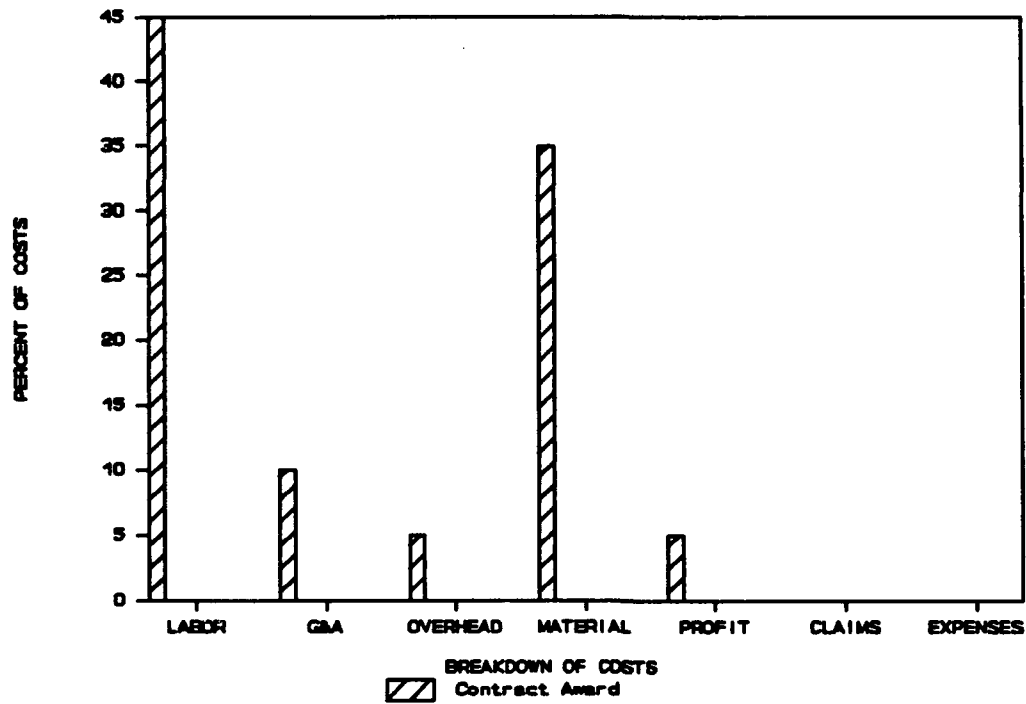


Figure 3. Contract Costs.

CONTRACT COSTS

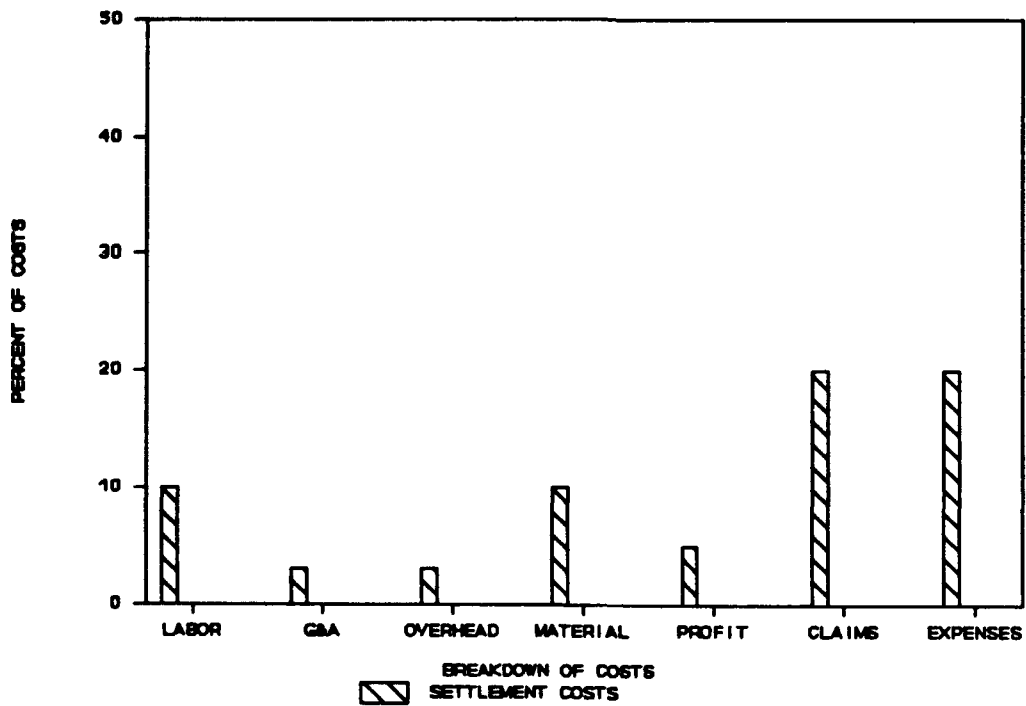


Figure 4. Settlement Costs.

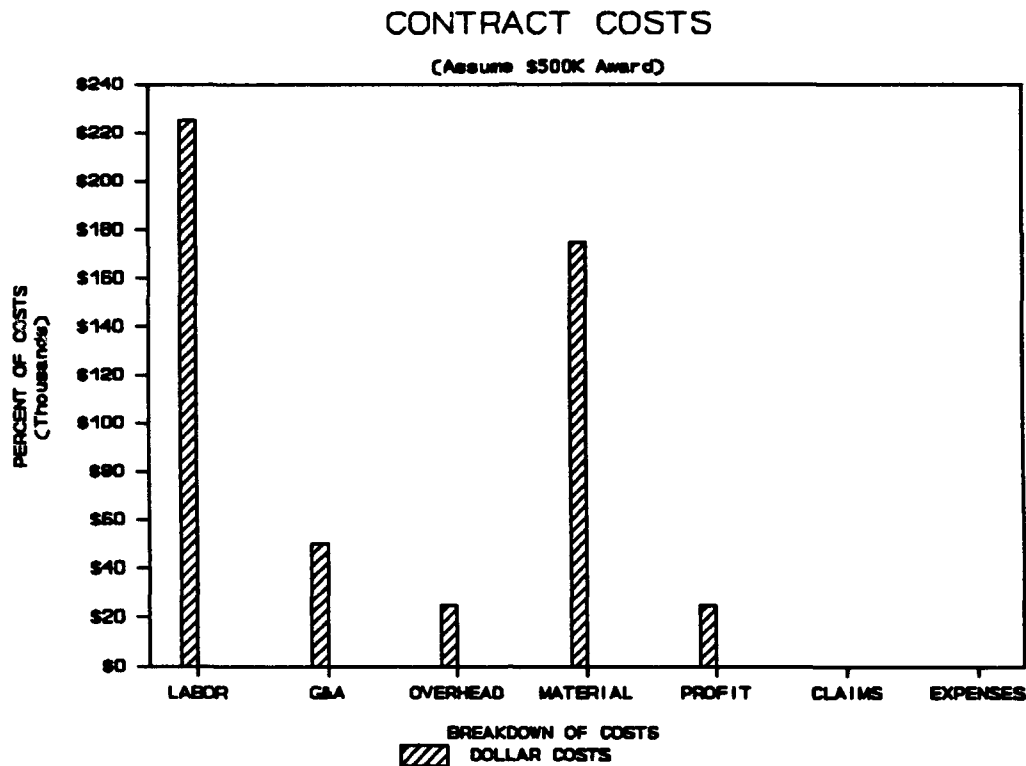


Figure 5. Dollar Costs.

MOBPRO's current rule of thumb equation states that at zero percent complete, 100 percent of the project dollars are recoupable; at 25 percent complete, about 75 percent of the dollars are recoupable; at 50 percent, 50 percent of the funds still remain; etc. In mathematical terms: $F - (F \times W_p) = B_1$, where F is the total funds or cost; W_p is the percentage of work complete; and B_1 is the balance remaining. The modified-rule equation is expressed in the following terms: $F - (F \times W_p) - (C + v) = B_2$, where C is the contractor's expenses and/or claims, and v represents the variance that can occur (or the degree of impact that the termination of the contract will have on the costs) as the project progresses. In other words, the contractor must recover an initial investment, but as the project progresses, the continued commitment of more materials, equipment, etc., will in turn cause higher settlement costs than if the project were terminated early on. Table 4 lists the data shown in Figure 7.

In its present formulation, this equation yields 59,049 possible plots on a graph (Figure 8), based on the presumptions of the hypothetical test example. It may be possible to narrow the range of possibilities to a more manageable "band" that represents relatively accurate upper and lower limits of resources that could be recouped by terminating a project at a given point in time (Figure 9). This range could help planners to plan for resources reallocation without fear of under- or overestimating the amount of resources to be gained (in other words, to avoid the danger of overobligating funds).

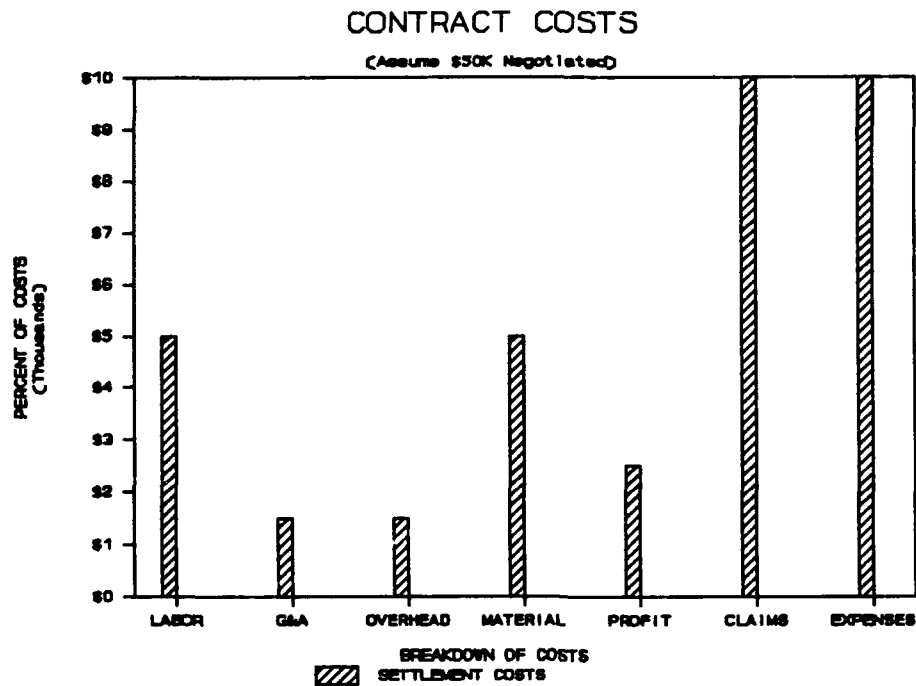


Figure 6. Settlement Costs (\$)

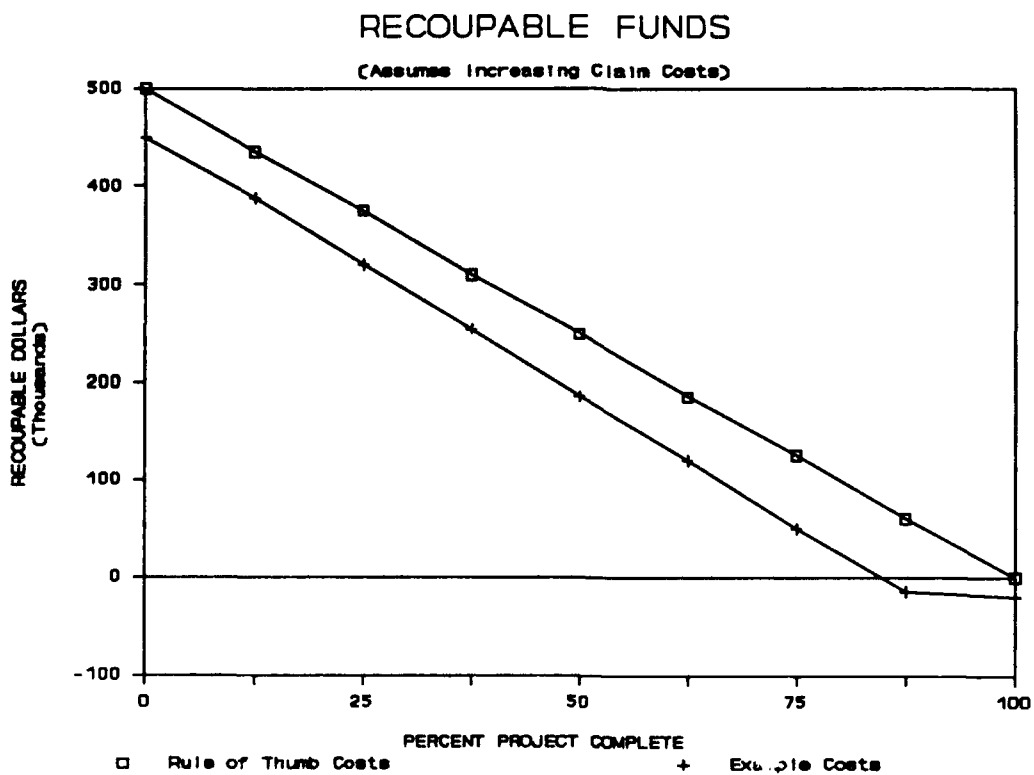


Figure 7. Recoupable Funds (Likely).

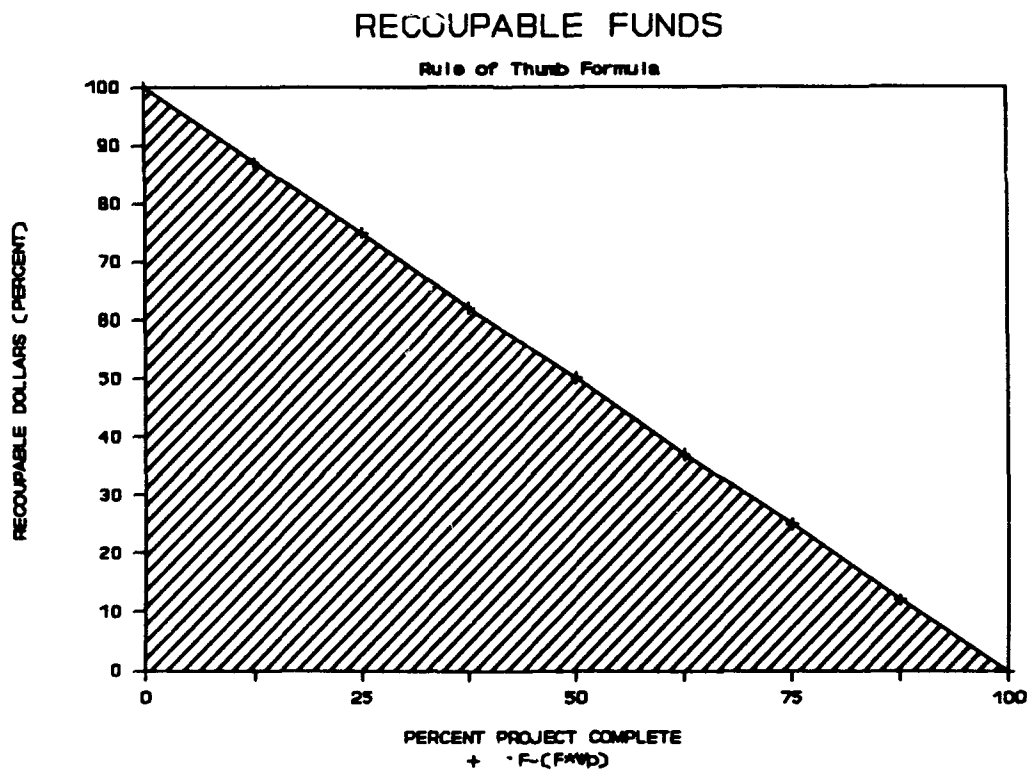
Table 4

Recoupable Funds (Likely)

$B1^*$ × \$1000	$B2^{**}$ × \$1000	F	W_p (%)	C	v
500	450	500,000	0	50,000	0
435	387	500,000	12	50,000	2.5
375	320	500,000	25	50,000	5
310	255	500,000	37	50,000	10
250	185	500,000	50	50,000	15
185	120	500,000	62	50,000	20
125	50	500,000	75	50,000	25
60	-15	500,000	87	50,000	30
0	-20	500,000	100	50,000	35

$$^* B1 = F - (F \times W_p)$$

$$^{**} B2 = F - (F \times W_p) - (C+v)$$

Figure 8. Unconstrained Possibilities for $F - (F \times W_p) - (C+v)$.

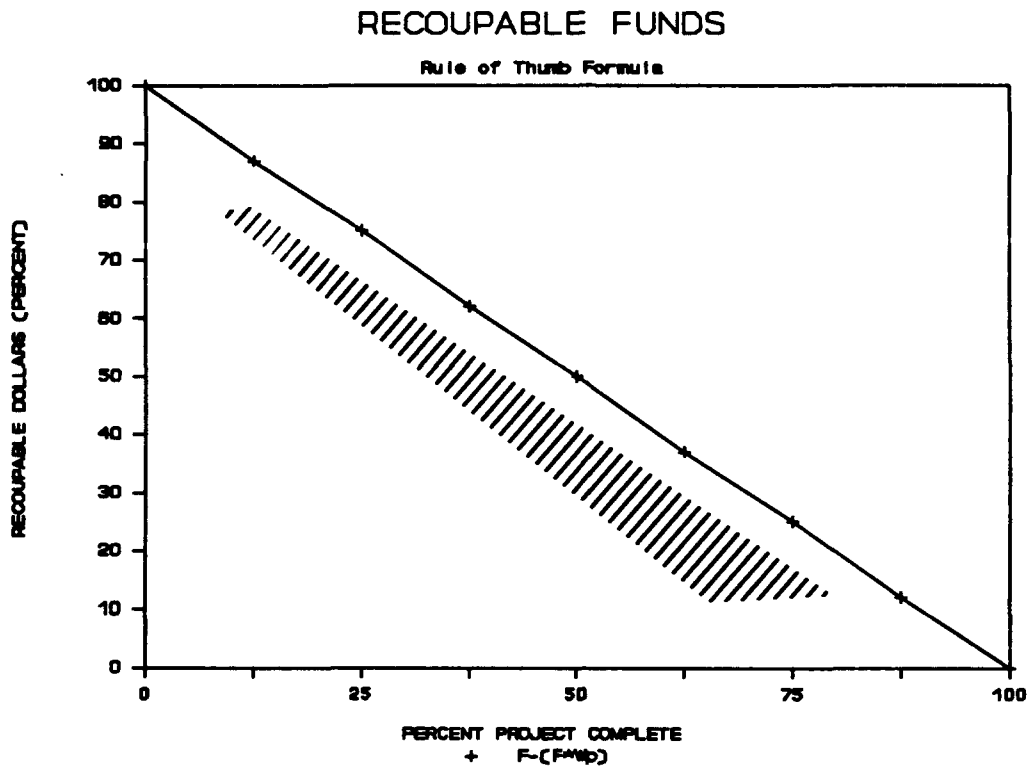


Figure 9. $F-(F*W_p)-(C+v)$ Constrained.

4 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study has explored several concepts and developed a modified formula to calculate the amount of recoupable funds made available from early termination of MCA construction projects.

The first concept was to develop a series of charts that reflect the many factors affecting the amount of recoupable resources made available by project termination. The development, publication, and periodic update of such hardcopy charts would be a cumbersome and time-consuming task that might delay a precisely timed mobilization. A more desirable solution might be to automate the decisionmaking process.

Interviews with expert project managers and construction contract administrators revealed the subtleties involved in estimating the amount of recoupable resources. A knowledge base and a set of rules of inference could be derived through such extensive, structured interviews to develop an expert system to calculate recoupable funds.

An expert system may be able to estimate recoupable resources at a given point in a project's life by combining techniques administrators already use with a modified version of the Mobilization Program's current equation for estimating recoupable resources: $F - (F * W_p) - (C + v) = B$. In its raw formulation, this equation gives a broad range of possibilities. However, data from an expert system may narrow the upper and lower range of possibilities so that it will neither under- nor overestimate the amount of recoupable resources.

Going beyond this initial concept to develop such a complex expert system with appropriate information and data bases would be a labor intensive project taking a minimum of 24 months for completion. Since actual mobilizations are rare, it is doubtful if such an undertaking would ever see a return on investment. The process of recouping the funds and other resources from terminated projects is connected with legal procedures that may take months to resolve, and that expend many manhours and much effort, all of which may further delay the immediate needs of a mobilization effort.

Recommendations

Much of the information required to characterize and classify an MCA project is already contained in Corps of Engineers information systems: Standard, Division-unique, and District-unique systems. It is recommended that any expert system based on the formulation set forth in this study include interfaces between the expert system and these Corps information systems to expedite the estimation process.

Since there is little information available from actual construction project terminations, it is recommended that guidance be provided to project managers regarding estimates of the (dollar) amount of construction actually placed since the last contractor invoice by analyzing data from completed construction projects. These historical projects could be classified in several important ways. By analyzing all projects with similar characteristics when they are, for example, 20 percent complete, and considering their completion percentage 1 month later (since there could be a lag of 1 month's time between contractor invoice submittals), a set of indices could be developed for projects by type. Such analyses could also be expanded to include other Government liabilities (such as supplies and equipment).

Some interviewees stated that a genuine concern that, in estimating recoupable funds, they must take care not to overestimate the amount of recoupable resources, since the overobligation of funds is a criminal offense. This concern is often satisfied by making "conservatively" low estimates, in other words, by not trying to recover too much funding. In theory, and also in a mobilization scenario, "conservative" estimates should not be "low" estimates, but estimates that take minimal risks, *all risks considered*. An expert system estimation procedure that consistently underestimates the amount of recoupable resources runs the risk of not fully supporting the mobilization effort. It is recommended that any estimation procedure developed in a follow-on effort take all competing risks into consideration.

Only MCA engineering projects were considered in this study. Projects funded out of the BASEOPS .K Account (or their analog in Family Housing) were not within the scope of this study. Often, the accomplishment of these smaller individual projects, especially in job order contracting (JOC), is done by performing a high number of repetitive tasks, e.g., re-roofing 85 identical family housing units, resurfacing 50 lane-miles of primary roads and shoulders to the same specifications, etc. Estimating the amount of recoupable resources for these detailed unit-price contracts may be less complex than for an MCA project, and may make more dollars available Army-wide to a mobilization effort. Since design projects involve mostly labor, and since it is thought that labor-intensive tasks would result in the recovery of a large percentage of the remaining resources, design projects should also be considered as sources for recouping funds. It is recommended that any followup on this study expand the type of projects considered as sources of recoupable funds.

Finally, it is recommended that any followup to this study take these steps:

1. Develop a detailed survey document for collecting information from expert project managers and construction contract administrators in the field.
2. Conduct extensive field interviews.
3. Identify the relevant data contained in the Corps of Engineers' information systems.
4. Develop a methodology for prioritizing the order in which construction contracts should be terminated, and a risk-assessment methodology aimed at balancing the risk of overobligating against the need to maximize support of the mobilization effort.

REFERENCES

- Army Regulation (AR) 415-15 (Draft), *Military Construction Program Development and Execution* (Department of the Army [DA], 5 June 1989).
- AR 415-28, *Department of the Army Facility Classes and Construction Categories* (DA, 1 November 1981).
- Engineer Pamphlet 415-345-2, (Draft) *Corps of Engineers Automated Management and Progress Reporting System (AMPRS) Data Dictionary* (DA, 30 November 1990).
- Federal Acquisition Regulations* (Department of Defense [DOD], 1 April 1984).
- Nash, R.C., Jr., and J. Cibinic, Jr., *Federal Procurement Law*, Vol II (George Washington University, Washington, DC, 1980).
- Nilsson, N.J., *Principles of Artificial Intelligence* (Morgan Kaufmann, 1980).
- Waterman, D.A., *A Guide to Expert Systems* (Addison Wesley, 1986).

ABBREVIATIONS

AMPRS	Automated Management and Progress Reporting System
B1	B1 is the balance remaining in the mathematical term: $F - (FxWp) = B1$.
B2	B2 is the balance remaining in the mathematical term: $F - (FxWp) - (C+v) = B2$.
BASEOPS	Base Operations; used in the text to refer to a type of operating account (BASEOPS .K account).
C	C is the contractor's expenses and/or claims in the mathematical term: $F - (FxWp) - (C+v) = B2$.
CEMP-XX	Corps of Engineers, Military Programs - the office symbol referenced for offices within the Military Programs directorate at HQUSACE.
COEMIS	Corps of Engineers Management Information System, which is the "official" cost information system of the Corps of Engineers.
CWE	Current Working Estimate
DEH	Directorate of Engineering and Housing
DFAR	Defense Federal Acquisition Regulation
DOD	Department of Defense
F	F is the total funds or cost in the mathematical terms: $F - (FxWp) = B1$ and $F - (FxWp) - (C+v) = B2$.
FAR	Federal Acquisition Regulation
FS	Facility Systems
FY	Fiscal year (from October 1st through September 30th)
G&A	General and Administrative (also, S&A)
HQUSACE	Headquarters, U.S. Army Corps of Engineers
JOC	Job Order Contract
K	Used to represent thousands or thousands of dollars
M	Used to represent millions
MCA	Major Construction, Army
MILCON	Military Construction

MOBPRO	Mobilization Program
OCE	Office of the Chief of Engineers
S&A	Supervisory and Administrative (also, G&A)
SF	Standard Form
USACERL	U.S. Army, Construction Engineering Research Laboratory
v	v represents the variance that can occur (or the degree of impact that the termination of the contract will have on the costs) as the project progresses in the mathematical term: $F-(F \times Wp)-(C+v)=B2$.
WWII	World War II
Wp	Wp is the percentage of work complete in the mathematical terms: $F-(F \times Wp)=B1$ and $F-(F \times Wp)-(C+v)=B2$.

APPENDIX A: Standard Fixed-Price Construction Contract Termination for Convenience Clauses

TERMINATION FOR CONVENIENCE CONTRACT CLAUSES

84 52.249-0001: Termination for Convenience of the Government (Fixed-Price) (Short Form) (Apr 1984) (Applicable to contracts of \$ 100,000 or less).

The Contracting Officer, by written notice, may terminate this contract, in whole or in part, when it is in the Government's interest. If this contract is terminated, the rights, duties, and obligations of the parties, including compensation to the Contractor, shall be in accordance with Part 49 of the Federal Acquisition Regulation in effect on the date of this contract.

(End of Clause)

85 52.249-0002 I: Termination for Convenience of the Government (Fixed-Price) (Apr 1984) - Alternate I (Apr 1984) (Applicable to contracts in excess of \$ 100,000)

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any in determining or adjusting any amounts due under this clause:

(1) Stop work as specified in the notice.

(2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.

(3) Terminate all subcontracts insofar as they relate to the work terminated.

(4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.

(5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.

(6) As directed by the Contracting Officer, transfer title and deliver to the Government (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.

(7) Complete performance of the work not terminated.

(8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.

(9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (6) above; provided, however, that the Contractor (i) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at the prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(d) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(e) Subject to paragraph (d) above, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (e) or paragraph (f) below, exclusive of costs shown in subparagraph (f)(3) below, may not exceed the total contract price as reduced by (a) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) below shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(f) If the Contractor and Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall

pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (e) above:

(1) For contract work performed before the effective date of termination, the total (without duplication of any items) of --

(i) The cost of this work;

(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (i) above; and

(iii) A sum, as profit on (i) above, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including --

(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;

(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and

(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(g) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (f) above, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(h) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(i) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (d), (f), or (k), except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (d) or (k), and failed to request a time extension, there is no right of appeal. If the Contracting Officer has made a determination of the amount due under paragraph (d), (f), or (k), the Government shall pay the Contractor (1) the amount determined by the Contracting Officer if there is no right of appeal or if no timely appeal has been taken, or (2) the amount finally determined on an appeal.

(j) In arriving at the amount due to the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(k) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(m) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

(End of Clause)

APPENDIX B: Termination for Convenience Settlement Form

SETTLEMENT PROPOSAL (TOTAL COST BASIS)

ORM APPROVED OUR NO.
9000-0012

Public reporting burden for this collection of information is estimated to average 2.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the FAR Secretariat (WES), Office of Federal Acquisition and Regulatory Policy, OSA, Washington, D.C. 20405; and to the Office of Management and Budget, Paperwork Reduction Project (8000-0012), Washington, D.C. 20503.

FOR USE BY A FIXED-PRICE PRIME CONTRACTOR OR FIXED-PRICE SUBCONTRACTOR

THIS PROPOSAL APPLIES TO (check one)

☐ A PRIME CONTRACT WITH
THE GOVERNMENT☐ SUBCONTRACT OR
PURCHASE ORDER

SUBCONTRACT OR PURCHASE ORDER NO.:

COMPANY

STREET ADDRESS

CITY AND STATE (include ZIP Code)

NAME OF GOVERNMENT AGENCY

GOVERNMENT PRIME CONTRACT NO. CONTRACTOR'S REFERENCE NO.

CONTRACTOR WHO SENT NOTICE OF TERMINATION

NAME

ADDRESS (include ZIP Code)

If moneys payable under the contract have been assigned, give the following:

NAME OF ASSIGNEE

EFFECTIVE DATE OF TERMINATION

ADDRESS (include ZIP Code)

PROPOSAL NO.

CHECK ONE

☐ INTERIM☐ FINAL

SF 1430, SCHEDULE OF ACCOUNTING INFORMATION

☐ IS☐ IS NOT ATTACHED (if not, explain)

SECTION I - STATUS OF CONTRACT OR ORDER AT EFFECTIVE DATE OF TERMINATION

PRODUCTS COVERED BY TERMINATED CONTRACT OR PURCHASE ORDER		FINISHED		UNFINISHED OR NOT COMMENCED		TOTAL COVERED BY CONTRACT OR ORDER
		PREVIOUSLY SHIPPED AND INVOICED	ON HAND	SUBSEQUENTLY COMPLETED AND INVOICED	NOT TO BE COMPLETED	
(a)	QUANTITY	(b)	PAYMENT TO BE RECEIVED THROUGH INVOICING	(c)	(d)	(e)
	\$					
	QUANTITY					
	\$					
	QUANTITY					
	\$					

SECTION II - PROPOSED SETTLEMENT

NO.	ITEM	TOTAL PREVIOUSLY PROPOSED	INCREASE OR DECREASE BY THIS PROPOSAL	TOTAL PROPOSED TO DATE	FOR USE OF CONTRACTING AGENCY ONLY
		(b)	(c)	(d)	(e)
1	DIRECT MATERIAL				
2	DIRECT LABOR				
3	INDIRECT FACTORY EXPENSE (from Schedule A)				
4	SPECIAL TOOLING AND SPECIAL TEST EQUIPMENT (SF 1432)				
5	OTHER COSTS (from Schedule B)				
6	GENERAL AND ADMINISTRATIVE EXPENSES (from Schedule C)				
7	TOTAL COSTS (Items 1 thru 6)				
8	PROFIT (explain in Schedule D)				
9	TOTAL (Items 7 and 8)				
10	DEDUCT FINISHED PRODUCT INVOICED ON TO BE INVOICED *				
11	TOTAL (Item 9 less Item 10)				
12	SETTLEMENT EXPENSES (from Schedule E)				
13	TOTAL (Items 11 and 12)				
14	SETTLEMENTS WITH SUBCONTRACTORS (from Schedule F)				
15	GROSS PROPOSED SETTLEMENT (Items 13 thru 14)				
16	DISPOSAL AND OTHER CREDITS (from Schedule G)				
17	NET PROPOSED SETTLEMENT (Item 15 less 16)				
18	ADVANCE, PROGRESS & PARTIAL PAYMENTS (from Schedule H)				
19	NET PAYMENT REQUESTED (Item 17 less 18)				

* Column (e), Section I, should only be used in the event of a partial termination, in which the total cost reported in Section II should be accumulated to date of completion of the continued portion of the contract and the deduction for finished product (Item 10, Section II) should be the contract price of finished product in Column (b), (c) and (d), Section I.

NOTE: - file Inventory Schedules (SF 1426, 1428, 1430, and 1432) for allocable inventories on hand at date of termination (See 49.206).

(When the space provided for any information is insufficient, continue on a separate sheet.)

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1430-103

STANDARD FORM 1436 (REV. 7-75)
Prescribed by GSA - FAR (48 CFR) 53.206(a)(2)

53-167

FEDERAL ACQUISITION REGULATION (FAR)

SCHEDULE A - INDIRECT FACTORY EXPENSE (Item 3)

DETAIL OF EXPENSES	METHOD OF ALLOCATION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

NOTE.- Individual items of small amounts may be grouped into a single entry in Schedules B, C, D, E, and G.

SCHEDULE B - OTHER COSTS (Item 5)

ITEM	EXPLANATION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

SCHEDULE C - GENERAL AND ADMINISTRATIVE EXPENSES (Item 6)

DETAIL OF EXPENSES	METHOD OF ALLOCATION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

SCHEDULE D - PROFIT (Item 8)

EXPLANATION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

(Where the space provided for any information is insufficient, continue on a separate sheet.)

STANDARD FORM 1436 (REV. 7-66) PAGE 2

SCHEDULE E - SETTLEMENT EXPENSES (Item 12)

ITEM	EXPLANATION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

SCHEDULE F - SETTLEMENTS WITH IMMEDIATE SUBCONTRACTORS AND SUPPLIERS (Item 14)

NAME AND ADDRESS OF SUBCONTRACTOR	BRIEF DESCRIPTION OF PRODUCT CANCELED	AMOUNT OF SETTLEMENT	FOR USE OF CONTRACTING AGENCY ONLY

SCHEDULE G - DISPOSAL AND OTHER CREDITS (Item 18)

DESCRIPTION	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

If practicable, show separately amount of disposal credits applicable to acceptable finished product included on SF 1428.)

(Where the space provided for any information is insufficient, continue on a separate sheet.)

STANDARD FORM 1438 REV. 7-1964 PAGE 3

53-169

SCHEDULE W - ADVANCE, PROGRESS AND FINAL PAYMENTS (FORM 10)			
DATE	TYPE OF PAYMENT	AMOUNT	FOR USE OF CONTRACTING AGENCY ONLY

(Where the space provided for any information is insufficient, continue on a separate sheet.)

This is to certify that the undersigned, individually, and as an authorized representative of the Contractor, has examined this termination settlement proposal and that, to the best knowledge and belief of the undersigned:

(a) AS TO THE CONTRACTOR'S OWN CHARGES. The proposed settlement (exclusive of charges set forth in item 14) and supporting schedules and explanations have been prepared from the books of account and records of the Contractor in accordance with recognized commercial accounting practices; they include only those charges allocable to the terminated portion of this contract; they have been prepared with knowledge that they will, or may, be used directly or indirectly as the basis of settlement of a termination settlement proposal or claim against an agency of the United States; and the charges as stated are fair and reasonable.

(b) AS TO THE SUBCONTRACTORS' CHARGES: (1) The Contractor has examined, or caused to be examined, to an extent it considered adequate in the circumstances, the termination settlement proposals of its immediate subcontractors (exclusive of proposals filed against these immediate subcontractors by their subcontractors); (2) The settlements on account of immediate subcontractors' own charges are fair and reasonable, the charges are allocable to the terminated portion of this contract, and the settlements were negotiated in good faith and are not more favorable to its immediate subcontractors than those that the Contractor would make if reimbursement by the Government were not involved; (3) The Contractor has received from all its immediate subcontractors appropriate certificates with respect to their termination settlement proposals, which certificates are substantially in the form of this certificate; and (4) The Contractor has no information leading it to doubt (i) the reasonableness of the settlements with more remote subcontractors or (ii) that the charges for them are allocable to this contract. Upon receipt by the Contractor of amounts covering settlements with its immediate subcontractors, the Contractor will pay or credit them promptly with the amounts so received, to the extent that it has not previously done so. The term "subcontractors," as used above, includes suppliers.

NOTE: The Contractor shall, under conditions stated in FAR 15.804-2, be required to submit a Certificate of Current Cost or Pricing Data (see FAR 15.804-2(a) and 15.804-6).

NAME OF CONTRACTOR	BY (Signature of authorized official)	
	TITLE	DATE
NAME OF SUPERVISORY ACCOUNTING OFFICIAL	TITLE	

APPENDIX C: Listing of Standard Fixed-Price Construction Contract Clauses

INDEX OF CONSTRUCTION CONTRACT CLAUSES

Edition of 20 July 1990

	FAR/DFARS	TITLE
1.	52.000-4198	DEFINITIONS
2.	52.000-4199	DEFINITIONS
3.	52.203-0001	OFFICIALS NOT TO BENEFIT
4.	52.203-0003	GRATUITIES
5.	52.203-0005	COVENANT AGAINST CONTINGENT FEES
6.	52.203-0007	ANTI-KICKBACK PROCEDURES
7.	52.203-0012	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS
8.	52.203-7001	SPECIAL PROHIBITION ON EMPLOYMENT
9.	52.203-7002	STATUTORY COMPENSATION PROHIBITIONS AND REPORTING REQUIREMENTS RELATING TO CERTAIN FORMER DEPARTMENT OF DEFENSE EMPLOYEES
10.	52.203-7003	DISPLAY OF DOD HOTLINE POSTER
11.	52.209-0006	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTOR DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT
12.	52.212-0008	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS
13.	52.212-0011	VARIATION IN ESTIMATED QUANTITY
14.	52.212-0012	SUSPENSION OF WORK
15.	52.214-0026	AUDIT--SEALED BIDDING
16.	52.214-0027	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA--MODIFICATIONS--SEALED BIDDING
17.	52.214-0028	SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS--SEALED BIDDING
18.	52.219-0008	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS
19.	52.219-0009 I	SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN--ALT. I
20.	52.219-0013	UTILIZATION OF WOMEN-OWNED SMALL BUSINESSES
21.	52.219-0016	LIQUIDATED DAMAGES--SMALL BUSINESS SUBCONTRACTING PLAN
22.	52.219-7000	SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS)
23.	52.220-0003	UTILIZATION OF LABOR SURPLUS AREA CONCERNS
24.	52.220-0004	LABOR SURPLUS AREA SUBCONTRACTING PROGRAM
25.	52.222-0001	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES
26.	52.222-0003	CONVICT LABOR
27.	52.222-0004	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT--OVERTIME COMPENSATION
28.	52.222-0006	DAVIS-BACON ACT
29.	52.222-0007	WITHHOLDING OF FUNDS

30.	52.222-0008	PAYROLLS AND BASIC RECORDS
31.	52.222-0009	APPRENTICES AND TRAINEES
32.	52.222-0010	COMPLIANCE WITH COPELAND ACT REQUIREMENTS
33.	52.222-0011	SUBCONTRACTS (LABOR STANDARDS)
34.	52.222-0012	CONTRACT TERMINATION--DEBARMENT
35.	52.222-0013	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS
36.	52.222-0014	DISPUTES CONCERNING LABOR STANDARDS
37.	52.222-0015	CERTIFICATION OF ELIGIBILITY
38.	52.222-0026	EQUAL OPPORTUNITY
39.	52.222-0027	AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION
40.	52.222-0035	AFFIRMATIVE ACTION FOR SPECIAL DISABLES AND VIETNAM ERA VETERANS
41.	52.222-0036	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS
42.	52.222-0037	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA
43.	52.223-0002	CLEAN AIR AND WATER
44.	52.223-0003	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA
45.	52.223-7500	DRUG-FREE WORK FORCE
46.	52.225-0005	BUY AMERICAN ACT--CONSTRUCTION MATERIALS
47.	52.225-0013	RESTRICTIONS ON CONTRACTING WITH SANCTIONED PERSONS
48.	52.227-0001	AUTHORIZATION AND CONSENT
49.	52.227-0002	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
50.	52.227-0004	PATENT INDEMNITY--CONSTRUCTION CONTRACT
51.	52.227-7033	RIGHTS IN SHOP DRAWINGS
52.	52.228-0002	ADDITIONAL BOND SECURITY
53.	52.228-0002	INSURANCE--WORK ON A GOVERNMENT INSTALLATION
54.	52.229-0003	FEDERAL, STATE, AND LOCAL TAXES
55.	52.231-7000	SUPPLEMENTAL COST PRINCIPLES
56.	52.232-0005	PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS
57.	52.232-0017	INTEREST
58.	52.232-0023	ASSIGNMENT OF CLAIMS
59.	52.233-0001	DISPUTES
60.	52.233-0003	PROTEST AFTER AWARD
61.	52.236-0002	DIFFERING SITE CONDITIONS
62.	52.236-0003	SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK
63.	52.236-0005	MATERIAL AND WORKMANSHIP
64.	52.236-0006	SUPERINTENDENCE BY THE CONTRACTOR
65.	52.236-0007	PERMITS AND RESPONSIBILITIES
66.	52.236-0008	OTHER CONTRACTS
67.	52.236-0009	PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

68.	52.236-0010	OPERATIONS AND STORAGE AREAS
69.	52.236-0011	USE AND POSSESSION PRIOR TO COMPLETION
70.	52.236-0012	CLEANING UP
71.	52.236-0015	SCHEDULES FOR CONSTRUCTION CONTRACTS
72.	52.236-0021	SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION
73.	52.236-7000	COMPOSITION OF CONTRACTOR
74.	52.236-7001	MODIFICATION PROPOSALS - PRICE BREAKDOWN
75.	52.236-7004	CONTRACT PRICES--BIDDING SCHEDULES
76.	52.243-0004	CHANGES
77.	52.243-7001	PRICING OF ADJUSTMENTS
78.	52.244-0001	SUBCONTRACTS (FIXED-PRICE CONTRACTS)
79.	52.245-0001	PROPERTY RECORDS
80.	52.245-0002	GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS)
81.	52.245-0004	GOVERNMENT-FURNISHED PROPERTY (SHORT FORM)
82.	52.245-0012	INSPECTION OF CONSTRUCTION
83.	52.248-0003	VALUE ENGINEERING--CONSTRUCTION
84.	52.249-0001	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM)
85.	52.249-0002	TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE)
86.	52.249-0010	DEFAULT (FIXED-PRICE CONSTRUCTION)
87.	52.252-0006	AUTHORIZED DEVIATIONS IN CLAUSES
88.	52.999-4016	DRUG FREE WORKPLACE
89.	52.999-4019	PROMPT PAYMENT FOR CONSTRUCTION CONTRACTS
90.	52.999-4027	TRANSPORTATION OF SUPPLIES BY SEA
91.	52.999-4058	ACCIDENT PREVENTION
92.	52.999-4075	NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA
93.	52.999-4089	CERTIFICATION OF REQUESTS FOR ADJUSTMENT OR RELIEF EXCEEDING \$100,000

APPENDIX D: Standard Construction Contract Special Clauses

<u>NUMBER</u>	<u>TITLE</u>
1.	PERFORMANCE OF WORK BY THE CONTRACTOR
2.	SUBMITTAL OF WORK TO BE PERFORMED BY CONTRACTOR
3.	COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK
4.	LIQUIDATED DAMAGES - CONSTRUCTION
5.	CONTRACT DRAWINGS, MAPS AND SPECIFICATIONS
6.	SUBMITTAL REGISTER (1)
7.	SUBMITTAL REGISTER (2)
8.	PROTECTION OF MATERIAL AND WORK
9.	PHYSICAL DATA
10.	CERTIFICATES OF COMPLIANCE
11.	TEMPORARY ELECTRICAL SERVICE
12.	PROJECT SIGN (1)
13.	PROJECT SIGN (2)
14.	BULLETIN BOARD
15.	TIME EXTENSIONS
16.	TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER
17.	CONTRACTOR QUALITY CONTROL
18.	PERFORMANCE EVALUATION OF CONTRACTOR
19.	PRESERVATION OF HISTORICAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES
20.	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS
21.	CONTRACTOR PAYMENT REQUEST
22.	SAFETY AND HEALTH REQUIREMENTS MANUAL
23.	AWARD OF MULTIPLE PROJECTS TO A SINGLE CONTRACTOR
24.	COLOR BOARDS (1)
25.	COLOR BOARDS (2)
26.	REQUIRED SOURCE FOR JEWEL BEARINGS AND RELATED ITEMS
27.	EQUIPMENT DATA
28.	AVAILABILITY AND USE OF UTILITY SERVICES
29.	SCHEDULE OF AVAILABLE UTILITIES
30.	IDENTIFICATION OF EMPLOYEES
31.	PAYMENT FOR MATERIALS DELIVERED OFFSITE
32.	FIRE PROTECTION FOR OFF-THE-ROAD CONSTRUCTION EQUIPMENT
33.	WARRANTY OF CONSTRUCTION
34.	ENFORCEMENT OF WARRANTIES
35.	HAZARD ANALYSIS PLAN
36.	SALVAGE MATERIALS AND EQUIPMENT
37.	LAYOUT OF WORK
38.	IDENTIFICATION OF GOVERNMENT FURNISHED PROPERTY
39.	GOVERNMENT FURNISHED PROPERTY
40.	PROPERTY RECORDS
41.	CONTRACTOR-PREPARED NETWORK ANALYSIS SYSTEM
42.	CONTRACTOR MAINTENANCE
43.	ASBESTOS SPECIAL CLAUSE
44.	ASBESTOS

- 45. AIRFIELD SAFETY PRECAUTIONS
- 46. LICENSE AGREEMENT TO PERMIT DISCLOSURE OF PROPRIETARY DATA
- 47. RIGHTS IN TECHNICAL AND COMPUTER SOFTWARE (1)
- 48. RIGHTS IN TECHNICAL DATA AND COMPUTER SOFTWARE (2)
- 49. CERTIFICATION OF TECHNICAL DATA CONFORMITY
- 50. TECHNICAL DATA-WITHHOLDING OF PAYMENT
- 51. IDENTIFICATION OF TECHNICAL DATA
- 52. VALIDATION OF RESTRICTIVE MARKINGS ON TECHNICAL DATA
- 53. LISTED AGGREGATE SOURCES
- 54. LAYOUT OF WORK
- 55. PERMITS AND RESPONSIBILITIES
- 56. DEMOLITION AND DECONTAMINATION OF EXISTING FACILITIES
- 57. CONSTRUCTION IN PROXIMITY TO EXPLOSIVES AREAS (1)
- 58. CONSTRUCTION IN PROXIMITY TO EXPLOSIVES AREAS (2)
- 59. PREFERENCE FOR DOMESTIC SPECIALTY METALS
- 60. TESTS
- 61. QUANTITY SURVEYS (1)
- 62. QUANTITY SURVEYS (2)
- 63. WATER
- 64. ELECTRICITY
- 65. VARIATIONS IN ESTIMATED QUANTITIES - SUBDIVIDED ITEMS
- 66. EQUIPMENT LAYOUT DRAWINGS
- 67. NOTICE OF RESTRICTION TO PRIME CONTRACTORS
- 68. SITE OUTAGES
- 69. PREFERENCE FOR U.S. FLAG AIR CARRIERS
- 70. APPLICABILITY OF PANAMANIAN LAW
- 71. MATERIALS
- 72. LABOR
- 73. CUSTOM DUTIES
- 74. ACQUISITION OF SUPPLIES AND SERVICES - PANAMANIAN PREFERENCE
- 75. RESPONSIBILITY FOR OBSERVANCE OF LAWS, ORDERS, AND REGULATIONS
- 76. REPATRIATION OF EMPLOYEES
- 77. QUARTERS
- 78. SUPERVISION AND MANAGEMENT BY PRIME CONTRACTORS
- 79. REPLACEMENT OF DEMOBILIZED STRUCTURES, EQUIPMENT, OR MATERIALS
- 80. ENGLISH LANGUAGE SUBMITTAL
- 81. NOTIFICATION OF VISA DENIAL
- 82. OVERSEAS DISTRIBUTION OF DEFENSE SUBCONTRACTS
- 83. HVAC COMMISSIONING FUNCTIONAL PERFORMANCE TESTING
- 84. EQUIPMENT OPERATING, MAINTENANCE, AND REPAIR MANUALS
- 85. KEY PERSONNEL, SUBCONTRACTORS, AND OUTSIDE ASSOCIATES AND CONSULTANTS
- 86. WORKER'S COMPENSATION INSURANCE (DEFENSE BASE ACT)
- 87. WORKER'S COMPENSATION AND WAR-HAZARD INSURANCE OVERSEAS

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